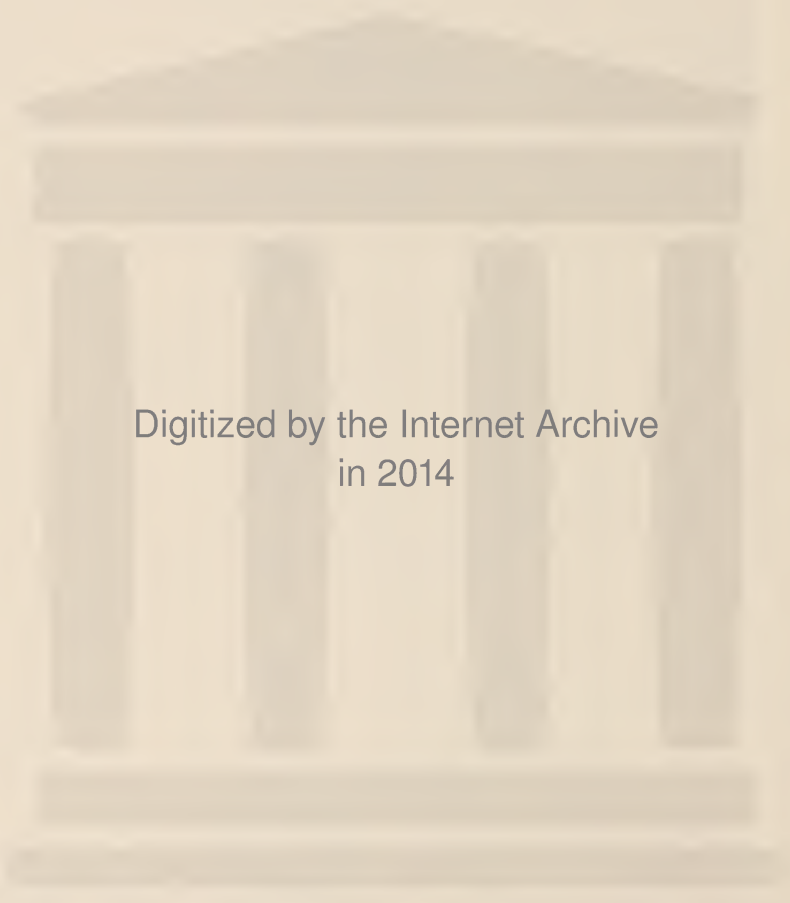




Digitized by the Internet Archive
in 2014

<https://archive.org/details/annualreportofne1981newy>



Profile of the New York Zoological Society

Founded in 1895, the New York Zoological Society consists today of five major divisions operating facilities in the United States and worldwide: the New York Zoological Park (Bronx Zoo); the New York Aquarium and Osborn Laboratories of Marine Sciences in Brooklyn; the Wildlife Survival Center on St. Catherine's Island, Georgia; and the Animal Research and Conservation Center (ARC), headquartered at the Bronx Zoo. ARC supports active research projects in countries ranging from the People's Republic of China to Zambia, and maintains stations in the Kibale Forest, Uganda; Amboseli National Park, Kenya; and Peninsula Valdes, Argentina. The Society's staff of 370 in all divisions includes curators, educators, veterinarians, animal keepers, research scientists, writers, administrators, artists and designers, photographers, gardeners, technicians, and a host of other support and maintenance specialists.

The *Bronx Zoo* and *New York Aquarium* are sensitive and popular sources of environmental education in the nation's urban capital. Serving a metropolitan New York population of more than 17,000,000, as well as visitors from around the world, they combine nature, recreation, and education as do no other city institutions. In particular, they seek to arouse an interest in wild creatures and to stimulate compassion for them. In recent years, the captive collections of the Zoo and Aquarium, totalling nearly 23,000 individual animals, have begun to fulfill a new, if unwanted role as long-term repositories for vanishing species, sustaining and perpetuating rare and delicate creatures which are disappearing in nature.

The *Wildlife Survival Center*, founded in 1974, is wholly devoted to the propagation and study of endangered species, and acts as a kind of distribution center for the renewal not only of zoo collections but also of nature itself.

The *Osborn Laboratories of Marine Sciences*, adjacent to the Aquarium and an integral part of its programs, has devoted its resources since 1968 to basic studies in the mechanisms of heredity, to the characteristics and cure of fish diseases (with a special view toward the application of this work to aquaculture), and to broad investigations in marine ecology.

The objective of the *Animal Research and Conservation Center* is to save pieces of nature. No other private conservation organization has a research program conducted by a staff of comparable size and expertise. As George Schaller, Director of ARC, has written, "We strive to obtain a better understanding of the structure, functioning, and stability of large ecosystems and to apply this understanding to their conservation." ARC's distinctive approach has already resulted in the creation, enlargement, or strengthening of nearly fifty reserves and parks, and in the education of many to whom the future is entrusted.

1981-82 Highlights and Vital Statistics

Attendance totalled 1,977,407 at the Bronx Zoo and 460,584 at the New York Aquarium between July 1, 1981 and June 30, 1982, representing increases of fourteen and eleven percent, respectively, over the previous year.

Membership in the Society reached 24,000, and nearly 40,000 individuals, foundations, and corporations contributed \$7,966,000 in dues and gifts.

Born or hatched at the Bronx Zoo and the Wildlife Survival Center were 943 mammals, birds, reptiles, and amphibians, among them individuals of thirty-nine endangered species.

Noteworthy births and hatchings included Astor, male Indian elephant; Manhar, male gaur, after embryo transfer; Nyci, female beluga whale; Snow Cap, male polar bear; three Baringo giraffes; six snow leopards; one Congo peacock; four white-naped cranes; nine Siamese crocodiles; and fifty-eight anacondas.

Major exhibition facilities opened at the Bronx Zoo were the Carter Giraffe Building and the Harry De Jur Aviary/Seabird Colony. The Aquarium inaugurated its marine mammal holding facilities and exhibitions for the marine life of Madeira and deep-water catsharks and giant isopods.

The new Children's Zoo attracted 546,858 visitors, nearly twice the attendance at the old facility in its last full year and thirty-one percent of the Zoo's concurrent attendance.

Friends of the Zoo, numbering almost 200 members, gave educational tours for more than 12,000 visitors and volunteered about 4,000 hours in the Children's Zoo.

The Animal Research and Conservation Center sponsored sixty-one research projects in thirty-two countries around the world, including new efforts in Kenya, Tanzania, Australia, India, the Philippines, Sri Lanka, Belize, Costa Rica, Argentina, and Colombia.

Plans were completed for the construction of a modern new animal hospital at the Bronx Zoo, and major funding was allocated by the City of New York. The 18,000 square-foot facility will be the center of veterinary care and research for the Bronx Zoo, the New York Aquarium, and three zoos in the City system to be renovated and operated by the Society.

New York Zoological Society Annual Report 1981-82



Cover:

This Raggiana bird of paradise, shown in courtship display, is one of several birds of paradise recently collected by NYZS Curator of Ornithology Donald Bruning in Papua New Guinea. Exhibition of these birds at the Bronx Zoo will be accompanied by a cooperative breeding program and an ARC-sponsored effort to preserve many of the forty species in their native habitats.

Trustees and Advisors of the New York Zoological Society (at June 30, 1982)

Board of Trustees

Officers

Laurance S. Rockefeller, Honorary
Chairman of the Board
Howard Phipps, Jr., President
Charles W. Nichols, Jr., Chairman
of the Executive Committee
Henry Clay Frick II, Vice-president
John Pierrepont, Vice-president
David T. Schiff, Treasurer
Frederick A. Melhado, Secretary
John McKew, Assistant Secretary

Trustees

Alexander Aldrich
Mrs. Vincent Astor
George F. Baker III
Frederick W. Beinecke II
Michel C. Bergerac
Guy F. Cary
Mrs. Edgar M. Cullman
John Elliott, Jr.
C. Sims Farr
Mrs. William Ward Foshay
Henry Clay Frick II
Robert G. Goelet
Nixon Griffis
Gilbert M. Grosvenor
Enid A. Haupt
Arthur Hauspurg
Peter C.R. Huang
John N. Irwin II
Frank Y. Larkin
John E. Leslie
W. Barnabas McHenry
Anthony D. Marshall
Frederick A. Melhado
Charles W. Nichols, Jr.
Augustus G. Paine
Richard T. Perkin
Howard Phipps, Jr.
John Pierrepont
Mrs. John L. Procope, Jr.
Richard I. Purnell
Eben W. Pyne
Laurance S. Rockefeller
Guy G. Rutherford
John T. Sargent
David T. Schiff

Ex-Officio Trustees

The Mayor, City of New York
The Commissioner, Cultural
Affairs, City of New York
The Commissioner, Parks and
Recreation, City of New York
The President, Borough of the
Bronx
The President, Borough of
Brooklyn

Honorary Trustees

Robert E. Blum
David Hunter McAlpin
John M. Schiff
Chauncey D. Stillman
Alice Tully
Lila Acheson Wallace
Robert Winthrop

Board of Advisors

Rand V. Araskog
Mrs. Charles A. Dana, Jr.
Mrs. James H. Evans
Peter R. Gimbel
Otto Marx, Jr.
Peter Matthiessen
G.W. Merck
Mrs. Gordon Pattee
Sumner Pingree III
Mrs. Harmon L. Rimmel
Judith C. Symonds
Walter C. Teagle III
Mrs. Joseph A. Thomas
Mrs. Landon K. Thorne, Jr.
Mrs. Gerrit P. Van de Bovenkamp
William Wachenfeld
Mrs. Joseph R. Siphron, *ex-officio*

Standing Committees of the Board of Trustees

Executive Committee

Charles W. Nichols, Jr., Chairman
Mrs. Vincent Astor
John Elliott, Jr.
Mrs. William Ward Foshay
Henry Clay Frick II
Nixon Griffis
John N. Irwin II
Frank Y. Larkin
John Pierrepont
Eben W. Pyne
Laurance S. Rockefeller
Frederick A. Melhado, *ex-officio*
Howard Phipps, Jr., *ex-officio*
David T. Schiff, *ex-officio*

Investment Committee

Frederick A. Melhado, Chairman
George F. Baker III
Guy F. Cary
Frank Y. Larkin
John Pierrepont
Howard Phipps, Jr., *ex-officio*
David T. Schiff, *ex-officio*

Audit Committee

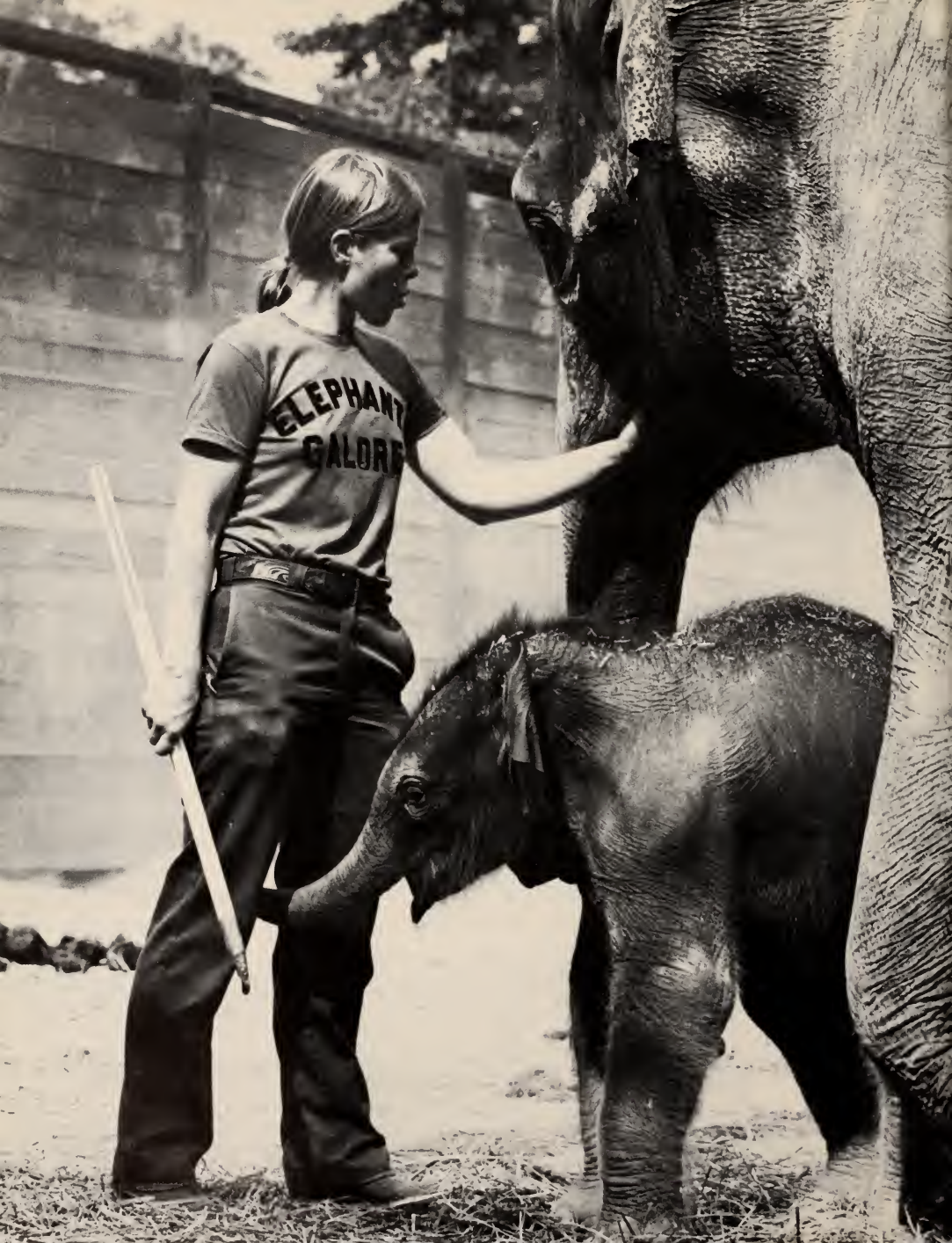
Eben W. Pyne, Chairman
Richard T. Perkin
Richard I. Purnell

Nominating Committee

Frank Y. Larkin, Chairman
George F. Baker III
Mrs. William Ward Foshay
Frederick A. Melhado
Eben W. Pyne
Howard Phipps, Jr., *ex-officio*

Table of Contents

Trustees and Advisors	2
Report of the President	5
Report of the General Director	9
A New Zoo for Central Park	14
New York Zoological Park	17
Mammalogy	17
Ornithology	19
Herpetology	21
Wildlife Survival Center	23
Animal Health	25
Zoo Education	27
Exhibition and Graphic Arts	30
Operations — Construction and Maintenance	31
 New York Aquarium and Osborn Laboratories of Marine Sciences	33
Aquarium Education	36
 Animal Research and Conservation Center	39
Geographic Distribution of ARC Projects	42
 Publications Department	44
1981/82 Publications and Papers	45
 Public Affairs	47
 Administrative Services	49
Admissions, Parking, and Transportation	49
Food and Souvenirs	49
Personnel	49
 Report of the Treasurer	50
Audited Financial Statements	53
 Contributions, Pledges, and Payments on Pledges	60
 Animal Kingdom Campaign	62
 Committees of the New York Zoological Society	63
 Staff of the New York Zoological Society	64



What we call Zoo Renaissance is happening at the Bronx Zoo, and throughout the New York Zoological Society's programs. Two beautiful new exhibitions opened in the Bronx this season. The Harry De Jur Aviary, constructed in the renovated great Flying Cage of 1899 with funds from the Harry De Jur Foundation and the City of New York, re-creates a rugged coastal environment for penguins, cormorants, gulls, and other shore- and seabirds. The Carter Giraffe Building and outdoor habitat exhibitions, a gift of Mr. and Mrs. James Walter Carter, provides a magnificent setting for some of Africa's rare mammals—Baringo giraffes, Grevy's zebras, cheetahs, and slender-horned gazelles.

To these and other developments at the Zoo, documented in this report, the public is responding enthusiastically. Climbing a steady climb over the past five years, attendance has reached its highest point since the early 1970s, nearly 2,000,000 people, or fourteen percent more than last fiscal year. At the New York Aquarium the increase was eleven percent, and there are comparable gains in almost every area of support for the Society.

Private donors like Mr. and Mrs. Carter and the Harry De Jur Foundation are among the 40,000 members and contributors now giving for Society programs citywide, nationally, and internationally. Their aggregate giving in the year ended June 30, 1982, amounted to \$7,966,000, the largest total for any year ever. During this period, gifts to the Animal Kingdom campaign totaled \$4,550,000; gifts for operating or budgetary purposes, \$2,641,000; and membership revenues, \$775,000. Membership enrollment reached 24,000 families and individuals.

Government support for the Society's diverse operations also increased substantially in the past fiscal year, from \$5,464,866 awarded by all City, State, and Federal agencies in 1980-81 to \$6,917,000 in 1981-82, a rise of nearly twenty-seven percent.

There are many individuals, committees, corporations, and government agencies to be thanked, of course, for their help and support.

First, our myriad volunteers. The Friends of the Zoo, nearly 200 strong, are based in the Bronx, and they have provided in the past year Zoo tours and information to over 50,000 visi-



Snow Cap, shown with his mother Olga, was named by Trustee Enid A. Haupt, who was honored for her generous contributions to the Society at the young polar bear's public debut on April 14, 1982.

tors and hundreds of groups. The Trustees and Advisors are helped in their fund-raising tasks by the Women's Committee and by the Business Committee. Mrs. Joseph R. Siphron has chaired the Women's Committee in the past year, and to her and the Co-Chairmen of the benefit held at the Aquarium in June, Mrs. George F. Baker, III and Mrs. Alexander B. Slater, we convey our thanks.

The Business Committee, chaired in the past year by Edgar M. Cullman and John Elliott, Jr., numbers thirty-two members currently, all active in our corporate fund-raising programs. Two members of this committee, both Trustees of the Society, have been instrumental in this period in securing especially substantial gifts and in their own corporate generosity. They are Arthur Hauspurg and Peter C.R. Huang. The corporations they operate, Con Edison and City Investing, are now among the most significant donors to the Zoological Society.

Two new campaigns were launched this year to increase the contributions of individuals, and both are chaired by volunteers. They are the Annual Patrons program, of which John Pierrepont and John Chancellor are Co-Chairmen, and the Friends of ARC program, of which Mrs. Edgar M. Cullman, Douglas Kreeger, and Charles W. Nichols, Jr. are Co-Chairmen. At June 30, 1982, the Society's Annual Patrons, donors of \$1,000 for unrestricted operating purposes, numbered 164, and the Friends of ARC, annual donors of \$2,500 or more to ARC programs, had grown to forty-six.

Two \$1,000,000 gifts were received during the fiscal year— from Enid A. Haupt and Louise C.P. Marshall. Between the end of the fiscal year and the preparation of this report, a third \$1,000,000 gift was made by the Willard T.L. Johnson Foundation. The Trustees wish to record here their tremendous sense of gratitude to these three major donors for their extraordinary support. All three gifts were made to the Society's Animal Kingdom capital campaign. Since its inception, approximately \$16,816,000 has been contributed toward our \$20,000,000 goal. For his leadership and wise counsel, the Trustees thank their associate John N. Irwin II, Chairman of the Animal Kingdom Campaign Committee, and all of us wish to thank the committee of distinguished citizens listed on page 63 of



The 1982 Annual Meeting on February 3 at Lincoln Center brought parts of the Bronx Zoo and New York Aquarium to more than 5,000 Society members.

this report who have lent their moral support to this campaign. It is our present intention to have finished the Animal Kingdom campaign by December 31, 1982.

The Society notes with great sorrow the deaths of James Walter Carter, donor of the new Giraffe Building; John H. Phipps, long a Trustee who labored on behalf of the Society and wildlife conservation; and James A. Oliver, Director Emeritus of the New York Zoological Park and former Director of the New York Aquarium.

Joining the Board of Trustees this year are Michel C. Bergerac, Frederick W. Beinecke, II, Enid A. Haupt, Peter C.R. Huang, and John E. Leslie, all of whom have been close to various aspects of the Society's work. They replace Dan W. Lufkin; Chauncey D. Stillman, who became an Honorary Trustee; and Otto Marx, Jr., George W. Merck, and Judith C. Symonds, all named to the Board of Advisors. Mrs. Harmon L. Remmel and Mrs. Landon K. Thorne were also added to the Board of Advisors, and Mrs. Joseph R. Siphron, as President of the Women's Committee, was named an *ex-officio* member.

The reports which follow detail the activities of a year in which final approvals were obtained with regard to the Society's future operation of the City zoos in Manhattan, Brooklyn, and Queens. That fact alone made this an extraordinary year, as it marked the beginning of an era in which the Society will be responsible for aiding the renewal of and then running public exhibition facilities in four of this city's five boroughs. My thanks to the Board and to General Director William Conway and his staff for the sustained effort which has made the growth and expansion reported here possible.

Howard Phipps, Jr.
President



The past year brought remarkable increases in Zoo and Aquarium attendance, in membership, and in support. The numbers are presented throughout these pages. Annual reports are commonly filled with numbers; a quantification of the means and extremes of the year just past expressed so as to permit comparison with previous years. Zoology, a science dealing with creatures more or less like ourselves, is particularly number prone. Quantification seems necessary as a kind of psychological distancing to better allow zoologists to view their subjects objectively, eschewing the "sin" of anthropomorphism. Subjectively, this seems to make individual animals and animal events even more interesting. So it was with the baby gaur, Manhar, with Patty, Groucho, and little Astor, and with Nyct, the white whale.

Manhar

Behind the old Camel Barn on a sultry evening last August, Flossie, a black-and-white Holstein dairy cow, gave birth to a bull gaur. Flossie was not the calf's genetic mother and had never seen its gigantic father, nor had she even been inseminated. Nevertheless, the calf grew in her womb and she raised the strangely alert and powerful youngster as though he were her own. Then Manhar joined the Zoo's herd of wild gaur, uneventfully—the herd of his father and mother and of a full sibling calf, two months younger, born to his genetic mother. Gaur are the largest of the world's wild cattle, and they are disappearing as their last homelands are overrun by man in tropical Asia. With Manhar, the Zoo had achieved the first successful embryo transfer between a vanishing wild species and a domestic surrogate, giving credibility to a conservation technology which had been no more than an idea.

Domestic cows can now be stimulated with hormones to produce four to six eggs rather than one at a time. The eggs are then inseminated and, after developing to the embryonic blastula stage in a few days, are flushed from the uterus and transferred to surrogate cows, which carry the embryos to term. This is now common practice in the cattle industry. An especially valuable cow can produce many young each year. Moreover, cattle embryos may be frozen, and preserved for use in future years, just as cattle and human semen are also stored. If such techniques can be adapted and modified for use in wild species, our chances of saving important segments of our endangered natural heritage will be significantly enhanced.



Nyci (New York City's First), the first beluga whale to be hand-reared in captivity, was nurtured round the clock and kept alive for eight weeks by Aquarium staff, including trainer Bob Greene.

To the extent that semen and embryos can be stored, the effects of inbreeding in small nature reserves and zoo populations can be avoided, and the expense and danger of catching and shipping live animals can be reduced. Manhar made history.

Astor

The first elephant to be born in New York (since the Ice Age) arrived last August 20 at 3:55 A.M. The son of Patty and Groucho was named Astor after NYZS Trustee Brooke Astor, who not only made the elephants' Zoo home in Wild Asia possible but also has been a continuing inspiration to the staff. Within days of his birth little Astor became a New York celebrity. Elephantomania became an affectionate and respectable affliction of Zoo visitors and staff alike, and it was abetted by the sensitive efforts of elephant trainer Larry Joyner.

"Elephants Galore Weekend" was the culmination. Elephant races and baths, behavioral demonstrations and traditional elephant painting and costumes were complemented by participatory children's games (such as "Find the Elephant in the Haystack"). The event, staged by Karin Bacon, Inc. and the Society's Public Affairs division, was highlighted by a wonderful tug-of-war between the young elephant Grumpy and the Fordham University football team, and by a truly joyous elephant parade of thousands of visitors, musicians, mimes, and staff, from one end of the Zoo to the other.

Nyci

Amid all the successes of the Society's wild animal breeding program, the year's most poignant moment came with the loss of the Aquarium's Nyci, the first white whale to be bred, born, and reared for a significant period in captivity. Nyci's mother was Newfie, her father Blanchon. Separated from her mother at birth as a result of being injured by her father, she was not accepted when reintroduced. An extraordinary regimen of handfeeding ensued. Staff members plunged into the cold pool alongside the 140-pound infant from first light until after dark, for more than eight weeks. Enough may have been learned to assure future success, but Nyci died on October 18.

ARC

While Manhar and Astor blossomed at the Zoo and staff struggled to save Nyci at the Aquarium, Animal Research and Conservation Center scientists furthered efforts to help whole communities of wild creatures. ARC's sixty-one projects in thirty-two countries range from basic studies of the ecology and behavior of the giant panda and the mountain gorilla to

encouraging the protection of particularly critical wildlife habitats for penguins and whales.

Increasing human pressures upon such desperately endangered species as Sumatran rhinos, Chinese alligators, and California condors call for a continuum of the skills possessed by resource ecologists, park managers, geneticists, aviculturists, veterinarians, and other specialists. Appraising its resources anew, ARC finds ready at hand in the Zoological Park and Aquarium scientific staffs an asset unique in the field of wildlife conservation. No other conservation research organization could have collaborated with the World Wildlife Fund in a giant panda project by providing not only distinguished field scientists but also reproduction physiologists, veterinarians, and animal enclosure designers. ARC's second two-year report was published in 1982 and sets forth a remarkable record of achievement.

New exhibitions and capital improvements

On May 23, 1982 the great Flying Cage at the north end of the Zoo, originally constructed in 1899, was reopened as the Harry De Jur Aviary, home of the unique Seabird Colony. First, its steel superstructure was refurbished and its wire-mesh replaced under New York City's Department of Cultural Affairs capital budget program. Then, the entire interior was elaborately reconstructed through the generosity of the Harry De Jur Foundation, in a series of beaches, ponds, rock outcroppings, and cliffs to resemble a part of South America's west coast by the cold Humboldt Current. With its wheeling Inca terns, braying Humboldt penguins and growling guanays, it is a wonderfully true-to-life seabird colony transported intact.

On June 12, the Carter Giraffe Building opened at the south end of the Zoo. James Walter Carter and his wife Margaret wanted visitors to be able to appreciate giraffes in a socializing herd among trees, hills, and grass—not a confining pen. Now they can, and more. For the first time in a decade, visitors attending the Zoo in the winter will also be able to see giraffes, zebras, and antelopes in heated indoor quarters. And the building is so arranged that it can care for substantial herds of two species in the Society's long-term propagation programs. With the birth of the first Baringo giraffe in the structure, a new Zoo tradition was established. The calf was named James I after Mr. Carter. By June 30, James III had been born and the birth of a Margaret was awaited.

In November 1981, exhibition work began within the partially



The new Carter Giraffe Building and its grounds provide beautiful hillside settings for cheetahs as well as giraffes, zebras, slender-horned gazelles, and ostriches.



Architect Kevin Roche describes the proposed renovation plan for the Central Park Zoo at the April 5, 1982 press conference.

completed Jungle World building. The firm of Mervin Larson, Inc. (which had fabricated exhibitions for the new Sea Lion Pool, the Harry De Jur Aviary, and the Children's Zoo) completed much of the Komodo monitor and proboscis monkey habitats by June 30.

Plans were also essentially complete for the modern animal hospital that will replace the 1915 structure. The new building, which had received exceptional input and support from the Department of Cultural Affairs, will provide services not only for the Aquarium and Bronx Zoo but also for all the other City zoos.

The City Zoos

Shortly after the beginning of the year, the Society and its architects, Kevin Roche-John Dinkeloo and Associates, submitted preliminary plans and models for a new Central Park Zoo to the City's Department of Parks. The concept was the product of more than eighteen months of struggle with design possibilities and budget constraints. Mr. Roche's design aroused both excitement and delight. Meetings with City officials and commissions produced general approval and the Society received word that it could proceed with planning in June. Meanwhile, Society staff also completed and submitted planning concepts for the renovation of Brooklyn's Prospect Park Zoo and Queen's Flushing Meadow Zoo, the development of which will proceed when City approvals are received.

The bare-bones statement above summarizes the results of countless meetings and plan reviews with concerned City officials, especially the Parks Department's constructive commissioner, Gordon Davis, and its director of planning, Katherine Wickham, and many many more with the remarkable architect Kevin Roche. The new zoo programs now constitute a major effort for the Society and its staff.

Animal Kingdom magazine

A program designed to launch *Animal Kingdom* as a more broadly based national magazine was reluctantly deferred. Although the magazine was attractively redesigned and achieved high marks from its surveyed readers, mail tests failed to justify the risks of an expensive launch. Nevertheless, the magazine continues to grow and it now serves more than thirty zoological societies around the nation.



Mrs. James Walter Carter (left), who with her late husband donated the Carter Giraffe Building, is joined by Society President Howard Phipps, Jr., Trustee Mrs. Vincent Astor, and Honorary Chairman of the Board Laurance S. Rockefeller at the new exhibition's opening on June 9, 1982.

Government support

Despite a nationwide decline in government support for arts, culture, and education, the Zoological Society continues to realize a greater percentage of support from the public sector than from any other source of revenue. Annual appropriations from the City and State constitute lifeline support for the Zoo and Aquarium. At the same time they provide leverage for raising much-needed private dollars.

Last year the City, through the Department of Cultural Affairs, appropriated \$5,388,104 for Zoo and Aquarium operations, an amount including substantial funding for utility expenses at both plants. These dollars support essential personnel in animal care, security, and grounds and facility maintenance.

Grants for capital construction and rehabilitation represent another significant investment by New York City in the future of the Zoo and Aquarium. Detailed elsewhere in these pages are projects underwritten in full or in part by City funds. The largest of these, a marine mammal holding facility, is a key element in new plans for upgrading exhibitions and requisite animal management capabilities at the Aquarium.

Since 1977, the New York State Office of Parks and Recreation has joined in the public stewardship of the Zoo's and Aquarium's collections. The State, through the Natural Heritage Trust, awards grants to "living museums" across the State to underwrite essential costs of operation. In 1981-82, State support increased to \$1,290,200.

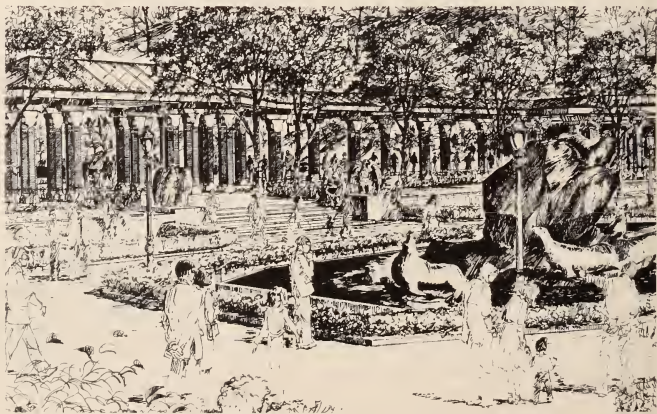
At the Federal level the Zoological Society was successful in securing continuation funding of \$181,919 for the second phase in the development of project WIZE. The award came at the initiative of the education staff of the National Science Foundation just as its entire directorate was being eliminated by budget cuts and changing federal policy in science education.

During the past year, the Government Affairs Office reached more than 1,100 individuals through a series of twenty briefing sessions and special events designed to communicate to legislators and other government officials the current and projected operational needs of the Zoo and Aquarium and to show the importance and effectiveness of their ongoing support.

William Conway
General Director



NYZS President Howard Phipps, Jr., Commissioner of Parks and Recreation Gordon Davis, Manhattan Borough President Andrew Stein, City Council President Carol Bellamy, Mayor Edward I. Koch, and Comptroller Harrison Goldin view the architectural model for the new Central Park Zoo at the April 1982 press conference.

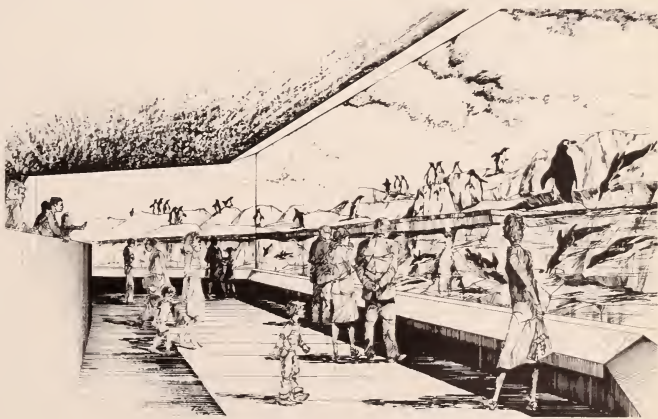


The new Central Park Zoo embodied in the plans of architect Kevin Roche is a garden-like place, a happy combination of thoughtfully subdued architecture and generously housed animals in the setting of one of the world's greatest parks. The number of buildings has been reduced and the entire site opened up to the Park by the removal of some lesser structures. A special character and organization is given by a graceful arcade which defines and shelters the zoogoers' principal paths and brings the various elements of the Zoo together.

The new Zoo's organization is ecological, presenting tropical, temperate, and polar environments in carefully representative sections. From south to north, zoogoers will visit an outdoor bird garden and orientation area, a "Tropical Zone," a temperate "Intelligence Garden," and finally, the "Polar Circle." Among the many animals to be exhibited are tropical birds and bugs, reptiles, monkeys, and even a leopard in the first area; snow monkeys, red pandas, and otters in the second; polar bears, seals, and penguins in the last. Many more animals will be shown than in the old zoo, but with greater selectivity. Similarly, exhibition space will be expanded but without appropriating additional land from the Park.

Construction of the new Zoo is expected to begin in 1983.

William Conway



Plans for the new Central Park Zoo include an arcaded central court focusing on the renovated sea lion pool (opposite page) and an extensive Polar habitat for penguins (right).



Astor and Manhar

On August 20, 1981, at 3:55 A.M., Astor, the first Asian elephant ever born at the Bronx Zoo, finally arrived after a twenty-three-month and three-day gestation. The 250-pound newborn was the progeny of parents that came from India as youngsters themselves in 1973. Many Asian animals are disappearing rapidly in nature, and Indian elephant populations have been reduced drastically over the last decade. Captive elephant births have always been rare because few zoos have the quarters to safely house male elephants, which may become dangerous during periods of sexual activity. When Wild Asia was planned, the Society therefore made special provisions for males, and these efforts have now been rewarded. Since his birth, Astor has thrived. In less than a year, he has more than tripled in weight and has become the most popular attraction of the Wild Asia exhibitions.

Of even greater significance to the future of captive breeding was the birth, on August 11, 1981, of Manhar, a bull gaur calf, to a Holstein dairy cow named Flossie. It was the first successful application of embryo transfer from a wild endangered animal to a surrogate domesticated mother. The gaur, a wild ox native to southern Asia, has been pushed to the brink of extinction by habitat loss and exposure to diseases introduced by domestic livestock throughout its native range. With the development of embryo transfer and other reproductive techniques, a field in which the Society's Animal Health Department has taken a leading role, it is hoped that captive propagation can be accelerated and that such species as the gaur will be given a better chance of survival. (See *Animal Health*, page 23.)

Carter Giraffe Building

One of the major elements in the Zoo Renaissance program, the Carter Giraffe Building and its surrounding outdoor ranges opened to the public on June 12, 1982. This integrated exhibition, funded by a generous gift from Mr. and Mrs. James Walter Carter, fills out the western section of the African Plains zoogeographic zone, replacing the old Antelope House with a modern exhibition building and a spacious, carefully contoured landscape where giraffes, zebras, slender-horned gazelles, cheetah, and South African ostriches are combined in contiguous ranges. Already three giraffes named for Mr. Carter—James I, II, and III—and one zebra have been born in the new surroundings, which will enable the Society to exhibit these rare animals throughout the year.

Exhibition improvements and planning

At the Great Ape House the outdoor gorilla habitat has been renovated to provide a more natural setting. By removing a dividing wall the exhibition area was unified and enlarged, and the concrete substrata was removed and replaced with a soft carpet of grasses more in keeping with the gorillas' own environment. Plans are still in progress for a much expanded gorilla exhibition.

Besides Astor, the most popular addition to Wild Asia is the exhibit for the rarely seen firefox, or red panda, which is viewed at treetop level from the Bengali Express. A pair of red pandas on loan from the National Zoo have made their home in several trees in the southwest corner of the Karakoram Range, which is also inhabited by Himalayan tahr and hooded vultures.

In the Wild Asia Jungle World building, work is progressing on the elaborate habitat exhibitions toward a completion date in 1985. Locations and designs are also being studied by the Society's scientific staff for an exhibition and breeding facility that will house one of the most successful captive snow leopards breeding programs in the country, which this year produced six kittens.

International programs

The Bronx Zoo has had the most success in breeding proboscis monkeys in North America, recording nine births since 1969. Unfortunately, the breeding group of this rare and most interesting primate from Borneo is descended from a single pair. The recent acquisition of two males from the Milwaukee Zoo and the Basel Zoo in Switzerland now makes it possible to continue breeding with unrelated matings. At the same time, the original Bronx male was shipped to Twycross Zoo in England, where it is hoped he will breed with two mateless females.

An agreement for the exchange of Przewalski, or Mongolian, wild horses with the Soviet Union was completed in 1982 after more than three years of effort. This rare exchange, a cooperative venture of the Bronx and San Diego zoos, was accomplished under the U.S.-U.S.S.R. Environmental Agreement. The Department of Interior's Office of International Affairs acted on the zoos' behalf in negotiations with the Soviet Union. The exchange may prove critical in the preservation of the Przewalski horse. Already extinct in the wild, the 420 specimens in captivity worldwide are extremely inbred. The exchange will provide both North America and the Soviet Union with three new animals and the po-



tential for much greater genetic variety. The Soviet horses coming to the U.S. are descendants of Orlitza III, captured in 1947 and the last specimen brought into captivity. Her line is virtually unrepresented in North America.

The breeding program for the brush-tailed (or pen-tailed) bettong has been enhanced with the addition of an unrelated male from the Antwerp Zoo. Three young have been sired by this male so far, making a total of thirty specimens in the Bronx Zoo's collection. An international studbook has been established at the Zoo for this highly endangered, rabbit-sized kangaroo.

Two species of rare deer inhabiting the Andean Mountains of Chile and Argentina are being studied, both in the wild and in captivity, by Mark MacNamara, Associate Curator of Mammalogy. Numerous offspring have been produced at the breeding center for pudu established in Nanuel Huapi National Park, Argentina, in 1979, and plans are being made for releasing some of these animals into the wild. A captive breeding program for the endangered huemul was initiated in 1980 on the La Dehesa Estancia near Santiago, Chile. The animals being studied there have produced three fawns, perhaps the first ever born in captivity.

After two years of negotiation, the New York and San Diego Zoological Societies, with the help of the Department of the Interior, have completed a trade of Przewalski's horses with the Soviet Union which may lead to strengthening the genetic diversity of an Asian and European species that now exists only in zoos.

Mammal Census, Bronx Zoo (as of Dec. 31, 1981)

Order	Families	Species	Specimens
Marsupialia—Kangaroos, phalangers, etc.	2	4	62
Insectivora—Moles, shrews, hedgehogs, etc.	2	2	4
Chiroptera—Bats	3	10	417 ±
Primates—Apes, monkeys, lemurs, marmosets, etc.	6	23	156
Edentata—Armadillos, sloths, anteaters	3	3	6
Rodentia—Squirrels, mice, porcupines, etc.	12	23	173 ±
Carnivora—Bears, raccoons, cats, dogs, etc.	6	26	99
Pinnipedia—Seals, sea lions, etc.	2	2	7
Proboscidae—Elephants	2	2	9
Perissodactyla—Horses, tapirs, rhinoceroses	3	6	43
Artiodactyla—Cattle, sheep, antelope, etc.	8	32	563
Totals	49	133	1539 ±

N.B. Totals include seventy-four specimens on loan to other collections from the NYZS, and forty on loan to the NYZS from other collections. Births for the calendar year totaled 406.

Harry De Jur Aviary/Seabird Colony

On May 23, 1982, the Zoological Society dedicated its unique exhibition of colonizing seabirds in the restored great Flying Cage. William Hornaday, the Bronx Zoo's first director, described the original 1899 structure as "one of the wonders of the Zoological Park." One hundred fifty-two feet long, seventy-two feet wide, and fifty-five feet high, the cathedral-like wiremesh cage then enclosed several large trees and a pool for waterbirds—herons, egrets, and flamingos.

Over the years, the Society's goal of exhibiting animals in natural surroundings has remained unchanged, but techniques for providing realistic environments have become more sophisticated. A grant from the Harry De Jur Foundation made possible the re-creation of homes for several coastal birds in a single setting, with a water parterre meandering through artificial rocks and sandy shores. Displayed are not only gulls, terns, and penguins but an entire way of life, the myriad interactions between seabirds and their rugged coastal environment.

The major viewing area is a walkway through the cage itself, at the foot of an eroded and stratified bluff where Inca terns will nest. Across an expanse of water is a large, rocky island where nesting burrows—two now occupied by incubating pairs—are available for the group of Humboldt penguins. Andean and silver gull chicks have already hatched in nests placed in rock crevices. Cormorants can be



Now numbering less than sixty living specimens, the pink pigeon from Mauritius is one of several severely endangered bird species acquired by the Society over the past year for captive breeding.

seen sunning and swimming and Inca terns diving for fish. The exhibition has been an impressive success with its inhabitants as well as visitors.

Pink pigeons and other acquisitions

A significant addition to the collection this year was a group of eight pink pigeons, escorted from the Indian Ocean island of Mauritius in April by Curator Donald Bruning. Captive-bred on Mauritius, the birds represent about fifteen percent of the entire world population. The species has been reduced to seven individuals in the wild. It is hoped that establishing a breeding group at the Bronx Zoo in addition to those on Mauritius and the Channel Island of Jersey will give the species a chance of survival. A pair of these handsome pigeons is on display in the endangered species exhibition at the World of Birds; the remainder are in Propagation I, the Zoo's additional bird breeding facility.

Other additions to the collection are a group of birds from South American jungles, including blue-shouldered mountain tanagers, white-eared solitaires, versicolor barbets, round-tailed manakins, and blue-necked, golden, spotted, and golden-masked callistes. A small flight cage was recently constructed in the South American Rain Forest allowing birds like these to acclimate to the exhibition before release. Also acquired was a group of young South African ostriches for exhibit in the new Carter Giraffe Building.

Captive breeding

Between July 1, 1981 and June 30, 1982, 1636 eggs were laid by birds in the collection, and about 200 chicks were hand-reared; many more were reared by parents. Despite difficulties in raising the rare Congo peacock, a male chick, hatched last August, has already been introduced to a mate from the Royal Zoo of Antwerp, Belgium, another is acquiring adult plumage, and the original pair has produced four more eggs. The Bronx Zoo has the only breeding group of the endangered Malayan peacock pheasant, which now includes three breeding pairs. Eleven chicks were raised in the last breeding season.

Staff activities

Dr. Bruning led a members' tour to China during October and conducted a survey of the Humboldt penguin population in Peru during July. While in Peru, he visited the site of the Andean condor release project and was able to photograph the birds, now flying free, that were hatched and hand-raised at the Bronx Zoo. Recent news indicates that these young condors are still doing well in the wild.

In June, Dr. Bruning left for Papua New Guinea, in the Southwest Pacific, to gather birds of paradise for the collection. This successful expedition, a collaboration with the Baiyer River Refuge in Papua, acquired several birds of paradise and other specimens which were scheduled to arrive at the Zoo in September.

Assistant Curator Christine Sheppard was named keeper of the international studbook for *Grus vipio*, the white-naped crane. Already hatched this summer are four white-naped crane chicks, including a second generation hatching from a new breeding pair. A new pair of hooded cranes was obtained in January. Three hooded crane chicks from the original breeding pair have also hatched.

Dr. Sheppard spent the last two weeks of April in the Philippines as technical and scientific advisor to research on the black shama, sponsored by the Animal Research and Conservation Center. The project aims to provide a census for this thrush, once declared nearly extinct, and to study its population biology. Dr. Sheppard was also able to briefly survey the status of conservation in the Philippines.



Humboldt penguins, endangered and still declining numerically in Chile and Peru, form one of the lively colonies of sea- and shorebirds from Pacific South America in the new Harry De Jur Aviary.

Bird Census, Bronx Zoo (as of Dec. 31, 1981)

Order	Families	Species	Specimens
Struthioniformes—Ostriches	1	1	1
Rheiformes—Rheas	1	1	7
Casuariiformes—Cassowaries, emu	2	2	6
Tinamiformes—Tinamous	1	2	10
Sphenisciformes—Penguins	1	3	23
Pelecaniformes—Pelicans, cormorants, etc.	2	4	18
Ciconiiformes—Hérons, ibis, storks, flamingos, etc.	4	16	104
Anseriformes—Swans, ducks, geese, screamers	2	51	281 ±
Falconiformes—Vultures, hawks, eagles	3	9	27
Galliformes—Quail, pheasant, etc.	3	19	187
Gruiformes—Hemipodes, cranes, rails, etc.	5	18	106
Charadriiformes—Plovers, sandpipers, gulls, etc.	9	25	131
Columbiformes—Pigeons, doves	1	8	15
Psittaciformes—Parrots, etc.	1	14	34
Cuculiformes—Touracos, cuckoos	1	7	27
Strigiformes—Owls	1	9	20
Caprimulgiformes—Frogmouths, etc.	1	1	17
Apodiformes—Hummingbirds, etc.	1	2	4
Trogoniformes—Quetzals	1	1	5
Coliiformes—Colies	1	1	3
Coraciiformes—Kingfishers, hornbills, etc.	5	11	33
Piciformes—Barbets, toucans, woodpeckers	2	5	8
Passeriformes—Perching birds	24	77	254
Totals	73	287	1321 ±

N.B. Totals include ninety-two specimens on loan to other collections from the NYZS, and forty-two on loan to the NYZS from other collections. Hatchings for the calendar year totaled 360.

Crocodilian conservation

Crocodilians, survivors from the Age of Reptiles, face an uncertain future. Some of these archosaurs are perilously close to extinction. Like the spotted cats, they have been hunted to exhaustion, and suffer from habitat ruination. The loss of these dominant carnivores from the ecosystem forecasts trouble for all reptiles, as it does for the entire animal kingdom. For this reason, the Herpetology Department has made a major commitment to crocodilian conservation by initiating captive breeding programs, assisting other institutions to develop breeding projects, and undertaking basic research on crocodilian husbandry and reproductive biology.

In March, the collection's resident adult female Siamese crocodile nested in a stall adjacent to her exhibit. Nest construction by the female and the guarding activities of both parents were viewed by visitors on a television monitor. In mid-May, nine offspring were hatched, the first true crocodiles ever to hatch at the Bronx Zoo.

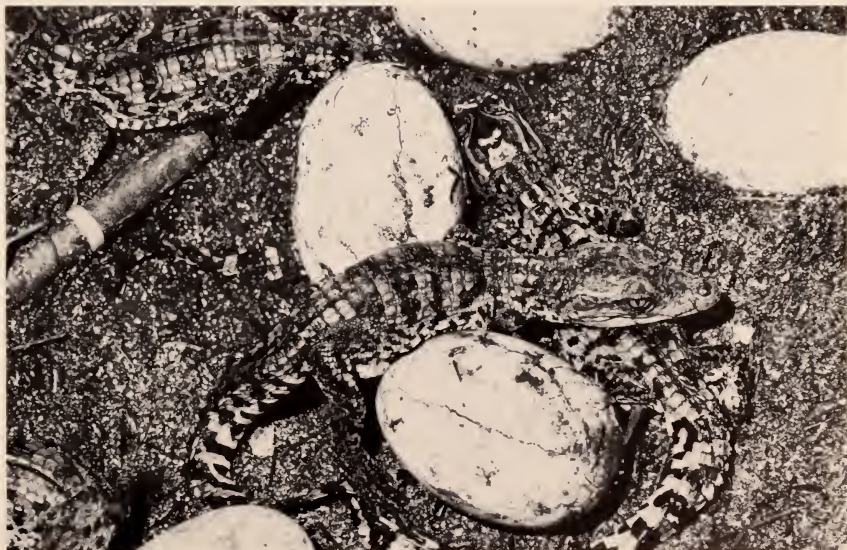
The Society's cooperative Chinese alligator propagation program at the Rockefeller Wildlife Refuge in Louisiana achieved recognition by the American Association of Zoological Parks and Aquariums at their 1981 annual meeting. The Society [and the

National Zoological Park] received the Edward H. Bean Award for the most notable reptile birth in 1980. And the Society's petition for a Chinese alligator studbook was favorably reviewed by the International Union for the Conservation of Nature and Natural Resources and the International Union of the Directors of Zoological Gardens. It is the first reptile species studbook.

Hatchings, births, and acquisitions

For the ninth consecutive year, Muhlenberg's turtles reproduced in the collection. Indian travancore and Malagasy radiated tortoises were also hatched. All three of the collection's adult female anacondas gave birth. Among the fifty-eight offspring were fifteen young produced by a female anaconda that was born in the Reptile House four years earlier. At year's end, more than 100 forest, red spitting, and king cobra eggs were incubating—including thirty-eight eggs from a female king cobra hatched in 1977.

Acquisitions during the year included six gila monsters from the Philadelphia Zoo, four young West African Gaboon vipers from Albuquerque's Rio Grande Zoo, and two rhinoceros iguanas, one each from the National Zoological Park and the Los Angeles Zoo. A pair of New Guinea Fly River



A microphone (upper left) records sounds of some of the nine Siamese crocodiles hatched in May 1982.

turtles, ten false water cobras, and a trio of bizarre Guianese emerald tree frogs were added to the collection. Of special importance, the Peking Zoo presented the Society with an adult male Chinese alligator and the San Diego Zoo sent, on breeding loan, another pair they had received from China.

Exhibitions and research

During the year several new exhibits were completed, including those for West African Gaboon vipers; the Russell's viper; Blomberg's toads, rare giant toads from Columbia; and red-cheeked mud turtles from Central America. The enclosure for the endangered dwarf and yacare caimans and giant Amazon sideneck turtles was totally renovated.

In addition to its involvement in reptile husbandry, captive propagation, and life history studies of native herpetofauna, the staff continued its research on the use of the doppler ultrasonic blood flow detector for locating the heart and blood vessels in reptiles. Assistance was given to the New York Department of Environmental Conservation during the recent review and subsequent revision of New York's endangered species list, and the staff also served U.S. Fish and Wildlife Service investigations by identifying large numbers of endangered reptile products.



Fifty-eight anacondas, giant constricting snakes of the Amazon basin, were born in 1981-82, each more than three feet in length at birth. The newborn anacondas were exhibited at the Reptile House Nursery.

Reptile and Amphibian Census, Bronx Zoo (as of Dec. 31, 1981)

Class	Order	Families	Species	Specimens
Amphibia	Caudata—Salamanders	2	5	19
	Salientia—Frogs, toads	7	17	86
Totals		9	22	105
Reptilia	Testudinata—Turtles	7	36	214
	Crocodylia—Alligators, caimans, crocodiles	2	12	78
	Squamata			
	Sauria—Lizards	8	17	64
	Serpentes—Snakes	6	62	375
Totals		23	127	731

N.B. Totals include eighty-eight specimens on loan to other collections from the NYZS, and eighty-four on loan to the NYZS from other collections. Births and hatchings for the calendar year totaled 188.

Breeding programs at the Society's Wildlife Survival Center on St. Catherine's Island in Georgia continued to expand in fiscal 1982, with the addition of seven new species and ninety-two young either hatched or born. The construction of new facilities and important reproductive and behavioral research filled out an active year.

New facilities

A new aviary completed in October 1981 houses a number of species, including nocturnal and greater curassows, crowned pigeons, and Indian pied, Malayan wreathed, and concave-casqued hornbills. Other improved accommodations for birds are the sixteen new pens that will protect young cranes and parrots from predators, and a new breeding complex, now under construction, that will eventually provide space for eighteen pairs of cranes.

Adjacent to the aviaries is a new facility for primates that is housing four species of lemur acquired during the year. These prosimians, which thrived in the isolation afforded by Madagascar's separation from the African continent, are increasingly threatened by human exploitation of their rain-forest habitat.

Propagation and acquisition

Forty-nine chicks were produced by eight of the thirteen bird species at St. Catherine's, including wattled cranes and greater curassows. Three fertile eggs were produced by the maleos, rare members of the megapode family from Celebes Island in Indonesia, and are expected to hatch in August. These unusual birds normally incubate their eggs in volcanically warmed sand, where they hatch unattended. Despite efforts to protect nesting areas in nature, the eggs, which are prized for their size, continue to be hunted by feral pigs. Among the five new bird species acquired, the most significant was a pair of St. Vincent's parrots, which are critically endangered in the wild due to the devastation caused by two hurricanes and a volcanic eruption in addition to human encroachment in breeding areas.

In the Center's mammal collection forty-three births were recorded, including four slender-horned gazelles, three parma wallabies, and three Jackson's hartebeests. Six Arabian oryx were acquired from the San Diego Zoo and the Gladys Porter Zoo in Brownsville, Texas. Thought to be extinct in the wild, this rare antelope has survived as a result of captive propagation efforts.

Reptile propagation focused again on radiated tortoises, with nine sexually mature specimens acquired from Dr. William Zovickian, a Research Associate of the Society, and the Memphis Zoo. The Center also obtained a pair of the extremely rare angulated tortoise, which are thought to number no more than ten in their native Malagasy. Only one other pair exists in captivity, so that breeding at the Center is extremely important if the species is to survive.

Research projects

Studies of the reproductive physiology of gemsbok were conducted at the Center by the Society's Animal Health Department, with hormones used to synchronize ovulation in three females that were subsequently artificially inseminated. One of them conceived and should give birth in August 1982. The aim of this work is to develop techniques for applying common livestock technology to the breeding of rare antelope and to prepare for the possible use of embryo transfer from the endangered oryx to the gemsbok as a surrogate mother. This is the next step in a program of reproductive research that has already resulted in the birth of a gaur to a Holstein dairy cow at the Bronx Zoo.

Antelope behavior studies initiated by Dr. Terry Maple of the Georgia Institute of Technology have been expanded to include gemsbok, addax, and sable antelopes.

Staff activities and changes

John Lukas, Associate Curator since 1976, left the Center in June 1982 to take charge of the growing ungulate collection at White Oak Plantation in Yulee, Florida. He will continue as a Field Associate of the Society. James Murtaugh, a former collection manager at the National Zoological Park, was named Associate Curator of Mammals.

Selected for the summer intern program, now in its second year, were Richard Mazza, a graduate biology student from Iona College in New Rochelle, New York, and David Billing, a senior at Hiram College in Ohio. Both will assist in caring for the Center's collection and conduct independent projects under the supervision of the curatorial staff.

Wildlife Survival Center Census (as of Dec. 31, 1981)

Class	Order	Families	Species	Specimens
Mammalia	Marsupialia—Kangaroos	1	2	15
	Primates—Lemurs	1	1	4
	Perissodactyla—Zebras	1	1	9
	Artiodactyla—Antelope	1	8	124
Totals		4	12	152
Aves	Galliformes—Pheasants	2	3	13
	Gruiformes—Cranes, bustards	2	6	30
	Columbiformes—Pigeons	1	1	2
	Psittaciformes—Parrots	1	5	25
	Coraciiformes—Hornbills	1	3	5
Totals		7	18	75
Reptilia	Testudinata—Tortoises	1	3	34

N.B. Totals include two specimens on loan to other collections from the NYZS, and sixty-three on loan to the NYZS from other collections. Births and hatchings for the calendar year totaled 68.



Since the herd was first established in 1978, six Grevy's zebras have been born at the Wildlife Survival Center. This threatened species has been bred at the Bronx Zoo since 1950.

Reproductive research

Highlighting the New York Zoological Society's program of research in reproductive biology was the birth, at about six P.M. on August 11, 1981, of a seventy-two pound Southeast Asian gaur calf to Flossie, a domestic Holstein cow. It was the first successful use of embryo transfer from an endangered wild animal to a domestic animal and represents an impressive first step in the long-range effort to use the technique in the propagation of endangered species. Manhar, meaning in Hindi, "one who wins everyone's heart," was accepted by Flossie as her own, and the two enjoyed public attention outside the elephant house until June 1982, when the calf was moved to join the members of his own species in Wild Asia. It is hoped that the extensive reproductive research now being conducted by the Society will considerably advance techniques of captive propagation, including the establishment of frozen embryo and semen banks for many endangered species.

At the Society's Wildlife Survival Center on St. Catherine's Island, Georgia, other reproductive studies are being conducted with a species of large African antelope, the gemsbok. The charting of estrous cycles and reproductive behavior over a one-year period culminated in the first attempt at artificial insemination in December. This was followed in March 1982 with three additional inseminations, two using frozen semen. Future plans include embryo transfer for this species and then parallel studies on the rare Arabian oryx and related antelope.

These projects were originally funded by the Muskiwinni Foundation, the Perkin Fund, and the Edward John Noble Foundation, and have been further assisted by two Jessie Smith Noyes Foundation post-doctoral fellowships. Dr. Lyndall Erb Meuli, the fellow in endocrinology, studies reproductive cycles in a variety of species. Urine samples are collected daily and analyzed for different hormone levels. Along with observations of behavior and breeding dates, the new data provide an overall view of previously unknown reproductive patterns. These techniques have already proved invaluable in determining pregnancy for a beluga whale at the New York Aquarium and an elephant at the Zoo, both of which gave birth in 1981.

The work of the fellow in reproductive physiology, Dr. Nancy Schaffer, centered on semen collection and freezing techniques. In 1981, semen was successfully collected from twenty-six separate species of animals and successfully frozen for fifteen of them. In addition, Dr. Schaffer completed a study of reproduction in dromedary camels which will lead to significant publications on this subject.

Clinical studies and work abroad

The pathology program co-sponsored by the Society and the Animal Medical Center produced a solution to a long-term problem for one antelope species, determining also that several other species may have a similar nutritional disease. With the help of the Hoffmann-La Roche Company, which assisted in the crucial analyses, the theory of a vitamin E deficiency as cause for this fatal cardiac disease was proved, and the appropriate supplementations were administered.

Equipment was also provided by Hoffman-La Roche to record the heart sounds of various animals, many for the first time, during their regular examinations. In years to come, even more sophisticated recordings will be made and incorporated into a library of heart sounds for teaching purposes.

In the spring of 1982, Society Veterinarian Dr. Emil Dolensek once again traveled to China to train Chinese scientists in the collection and freezing of semen from the giant panda. Conditions were once again difficult, but the Chinese did succeed in inseminating two females at the Yin Xiong Gou breeding center in Sichuan Province. Urine samples collected during the study may be helpful in pregnancy diagnosis for this rare species, the subject of an intensive cooperative preservation effort by the Society, the World Wildlife Fund, International, and the Chinese government.



Veterinarian Dr. Emil Dolensek has assisted other NYZS personnel in planning a captive breeding program for pandas in China.

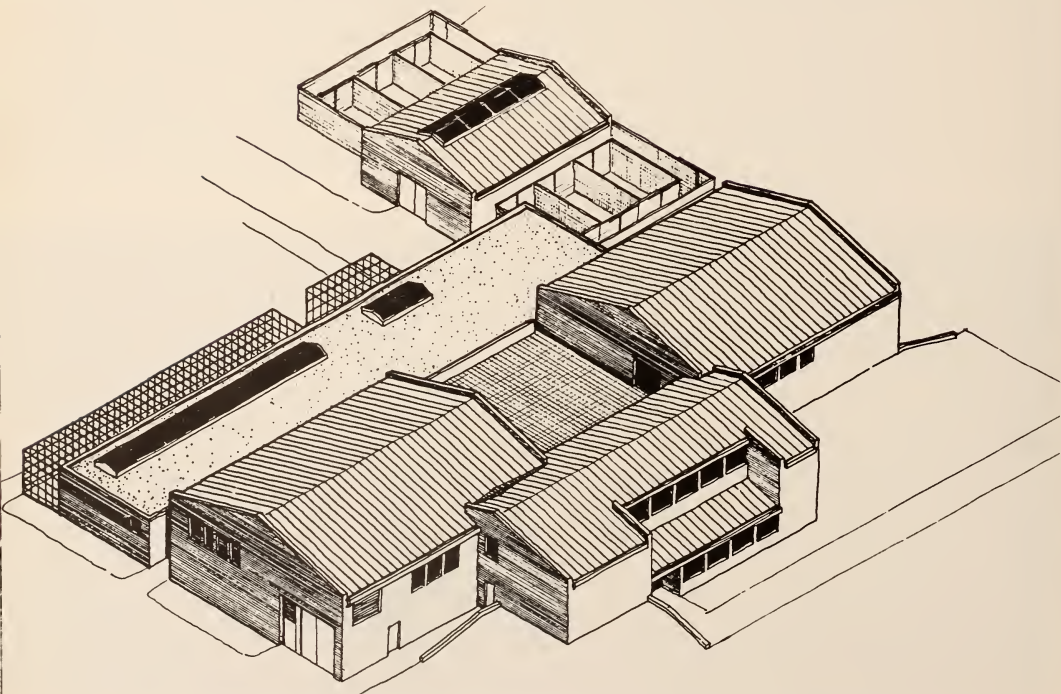
The new animal hospital

Plans for a new hospital at the Bronx Zoo are complete, and construction is scheduled to begin in fall 1982, with an allocation from the City covering two-thirds of the cost. The new building, seven times as large as the present hospital, which has been in continuous use since 1915, will answer the urgent need for more confinement, treatment, surgery, research, and administrative space, as well as the added responsibility of caring for animals in the City Zoos, when the Society assumes their operation in the mid to late 1980s.

In many respects, the new hospital will be the most advanced facility for zoological medicine and research in the world. The eight modules accommodate various functions. Four are devoted to animal holding areas for hooved stock, birds, pri-

mates, and carnivores. The surgical suite will include radiology and treatment areas capable of dealing with animals as large as an elephant.

The laboratory suite area will contain expanded versions of present labs for clinical pathology, including microbiology, hematology and parasitology, and new labs for research in reproductive biology and cytogenetics. Gross pathology, histology, and the Society's extensive library of pathological specimens are grouped in the seventh module, and administrative offices, library, and an apartment for the Medicine Resident in the eighth. The new building will provide ample space and modern facilities for veterinary functions that affect practically every aspect of the Society's programs—animal care and management, exhibition design, captive propagation, scientific research, and professional veterinary training.



The new animal hospital at the Bronx Zoo, seven times larger than the 1915 building now in use, will accommodate animals of every size from all the City zoos, an expanded program of research, particularly in reproductive biology, and a full course of professional training in zoological medicine.

Every Bronx Zoo visitor is in some way touched by the activities of the Education Department—through the Children's Zoo, formal classes and courses for children and adults, animals rides, the Wild Asia and Children's Theaters, guided tours, and Friends of the Zoo talks and tours. Narrations for the Safari Tour Train and the Wild Asia Bengali Express are written by the education staff and even the audio-visual equipment for the World of Birds, the Aquatic Bird House, the World of Darkness, and the Elephant Repertory is supplied and maintained by this Department. In addition, educational programs and publications reach the people of New York outside the boundaries of the Zoo, and others are now beginning to be directed toward a nationwide audience.

The Children's Zoo

The new Children's Zoo and new educational materials reflect a substantial expansion in the Education Department's programs, although the staff has remained essentially the same. During the past fiscal year, a record 546,858 children and adults visited the Children's Zoo, almost twice the attendance at the old Children's Zoo. Although most of the participatory activities and exhibits are designed for children, the ratio of children to adults was one to one. During the operating season (April 2 to October 31), thirty-one percent of all the Zoo visitors came to the Children's Zoo.

New artifacts and visual materials were added to the hourly show in the Children's Theater through a grant from the Heckscher Foundation for Children. The most prominent is a six-foot-tall fiberglass tree with bark the instructor pulls away to reveal homes for salamanders, mice, snakes, owls, and other small vertebrates. The Polaroid Foundation donated a new Special Events camera, and sales in the photographic booth have climbed as a result. Such increments are important, since all Children's Zoo admission and photo receipts go to the Education Department's operating budget and help support the production of new materials and programs for the more than 300,000 school children who visit the Bronx Zoo each year.

New uses for an old building

Additional space for the Department has been made available in the old Zebra House, which was gutted and renovated to serve as an Educational Services Building. Already being used to house animals for education programs, backup animals, and an animal kitchen for the Children's Zoo, the building will also provide an office, shower, and lounge space for supervisors and keepers; an ani-

mal behavior classroom; a large conference center for classes; and a home for Children's Zoo animals in the winter. Significant funding was provided by the Women's Committee, the Heckscher Foundation for Children, and The Barker Welfare Foundation toward the expense of remodelment.

Curriculum projects

While progress in educational programming has been made by American zoos during the last decade, little has been done in the area of structured curricula for early adolescent students. Because few individual zoos have sufficient in-house resources or staff to address this need, the Education Department is now developing Project WIZE—"Wildlife Inquiry Through Zoo Education"—in collaboration with the Philadelphia Zoo, the Topoka Zoo, and the Riverbanks Zoo in South Carolina. The \$357,000 grant awarded WIZE by the National Science Foundation was a major breakthrough for cooperative zoo education projects. Supplemental funding of \$20,000 has been received from the Charles E. Culpeper Foundation and the Sidney, Milton and Leoma Simon Foundation.

In the past year, approximately 1,500 sixth-through ninth-grade students in the four sponsoring cities participated with their teachers in evaluating two of the three project modules: "Diversity of Lifestyles" and "Survival Strategies." The curriculum will address the issue of wildlife survival in the twenty-first century—the main concern of today's zoos. It is hoped that the combined program of hands-on kits, resource books, and zoo visits will motivate a new generation of students to pursue studies in the life sciences. Draft materials will be revised after feedback from teachers, students, and a twenty-member advisory panel is collected. The prototype materials are intended for commercial publication and national distribution for use by school districts and zoos.

Project ZIP—"Zoo Information Packs"—was designed to serve the 300,000 schoolchildren who visit the Zoo annually. Funded by a \$70,000 grant from the William Randolph Hearst Foundation, these free packets guide the young visitor through the Bronx Zoo's animal exhibitions. Of the four modules to be developed, two have already been produced and tested. Two more units are in preliminary production and evaluation stages. In spring 1982, when all school teachers of grades one through six in the New York metropolitan area were informed about ZIP, requests came in at an extremely high rate. Combined with a pre-registration program, the ZIP project strengthens the educational value of Zoo visits. Pre-, post-, and in-

zoo activities extend the trip into the classroom and make the hours spent at the Zoo more meaningful, without involving the Zoo's teaching staff.

Wildlife courses at the Zoo

Forty-eight courses were offered for the fall/winter and spring/summer semesters. New dimensions were added to the formal class program by the opening of the Carter Giraffe Building and the Seabird Colony, and the birth of the elephant Astor, among the year's important events. Adults, children, and 12,796 students in organized groups attended such old favorites as "Zoo for Early Birds," and such new ones as "Central Park Zoo: A Sneak Preview," "Close-Up on Africa," "Animal Care," and "An Inside Look at the New York Zoological Society."

The 47,744 student instructional hours were divided equally between the general audience and organized school groups. Efforts to support the teacher salaries from course revenues met with increasing success. Of the nearly \$100,000 received in course fees, seventy-eight percent came from weekend courses and the summer camp program for teens, pre-teens, and tiny tots. Zoo Camp, which has spurred the creation of camps in nearly every major zoological park in the United States, entered its fifth year of operation.

"Windows on Wildlife"—in its fourth year, passed a crucial test in the education marketplace, now that private funding for the environmental science program for grades three through six has ended. During the year, Project WOW attracted sixty-five



In the expanded new Children's Zoo, participatory exhibits and educational opportunities are fully interpreted by Friends of the Zoo volunteers.

fee-paying classes and has now been taught to more than 5,400 children. The program concerns endangered species and their habitats and includes preparatory workshops for teachers, classroom preparation and follow-up materials, topic booklets, exercises, activities, and six hours at the Zoo.

On a smaller scale, "Animal Discovery" attracted 2,200 elementary level students for a mini-science program. For older students, new offerings such as "Animal Survival" and "Wildlife Communities in Danger," inspired by project WIZE themes, were added.

Friends of the Zoo

The Department volunteer program, Friends of the Zoo, is now nearly 200 members strong. A successful recruiting effort was made this year and another is being planned for the fall. FOZ volunteers offer free guided tours to school groups on weekdays and a number of services for children and adults on weekends. In addition to the daily work of interpreting Children's Zoo exhibits, FOZ conducts an outreach program for people in nursing homes and hospitals who cannot come to the Zoo. More than 12,000 people were given educational tours by Friends of the Zoo, who also volunteered more than 4,000 hours in the Children's Zoo.

Children's Zoo Census, Bronx Zoo (as of Dec. 31, 1981)

Class	Order	Families	Species	Specimens
Mammalia	Marsupialia—Opossum	1	1	1
	Insectivora—Hedgehogs	1	1	2
	Edentata—Armadillos	1	1	1
	Lagomorpha—Rabbits	1	1	6
	Rodentia—Mice, etc.	4	6	17
	Carnivora—Foxes, ferrets	2	3	8
	Perissodactyla—Horses	1	2	7
	Artiodactyla—Goats, sheep, camels, etc.	2	5	19
Totals		13	20	61
Aves	Ciconiiformes—Hérons	1	4	7
	Anseriformes—Ducks, geese	1	4	24
	Falconiformes—Falcons	1	1	2
	Galliformes—Chickens	1	1	8
	Strigiformes—Owls	2	4	7
	Columbiformes—Doves	1	1	1
	Psittaciformes—Parrots	1	4	4
	Piciformes—Toucans	1	1	1
	Passeriformes—Perching birds	2	2	3
Totals		11	22	57
Amphibia	Caudata—Salamanders	1	1	10
	Salientia—Frogs, toads	2	2	10
Totals		3	3	20
Reptilia	Testudinata—Turtles	2	8	26
	Squamata			
	Sauria—Lizards	3	5	10
	Serpentes—Snakes	2	5	13
Totals		7	18	49

N.B. Totals include one specimen on loan to the NYZS from another collection.

From the design and production of habitat exhibitions to the creation of brochures, maps, and signage, the Exhibition and Graphic Arts Department, working with other departments, is responsible for the functional and aesthetic coherence of the Bronx Zoo and other branches of the Society. In fiscal 1982 this entailed the completion of two major exhibition facilities designed by the exhibition staff, and substantial progress on another. Improvements were made in several exhibitions, while a new signage system and guide map for the public were approved.

Major exhibitions

The Harry De Jur Aviary for colonizing seabirds, occupying the renovated 1899 Flying Cage, was completed in the spring and opened to the public on May 23, 1982. Artificial rocks and cliffs, fashioned of cement sprayed and molded over wire mesh, provide a natural setting for Humboldt penguins, Andean and gray gulls, cormorants, Inca terns, Patagonian cormorants, and black oyster-catchers, carefully depicting the terrain, colors, and textures of elements from the Pacific coast of South America. The whole is unified by a meandering water parterre and may be viewed from three sides around the great cage, or from a path within the environment itself.

Another kind of experience is presented by the Carter Giraffe Building and its adjacent outdoor ranges for giraffes, cheetahs, zebras, and slender-horned gazelles, which opened on June 9, 1982. Murals on the walls of the interior spaces, where some of these African mammals will be seen during the winter months, attractively and accurately depict African savannah landscapes. The building itself blends with the five acres of range, which was designed by the exhibition staff and contoured to convey the open spaces of grassy plains in Africa. Wooden fencing reminiscent of types used in the bush country surrounds the entire area, and is penetrated by paths and alcoves that offer descriptive graphics, seating, and a better view of the animals. The outdoor and indoor exhibitions are another step in the completion of the Zoo's African zoogeographic area.

Jungle World

Work on the final component of Wild Asia, and the Society's largest and most ambitious indoor display of wildlife, is well underway. Jungle World will present seven major species of endangered Southeast Asian animals, along with smaller animals and free-flying birds, in a lush and richly detailed tropical environment, through which visitors

will journey on an elevated walkway. The island habitat for Komodo monitors and the mangrove swamp of Borneo have been nearly completed, and work has commenced on the rock formations, waterfalls, giant trees, vines, streams, and pools of the vast rain-forest habitat. Live plantings and a continuous mural will complete the re-creation of this diverse and delicately balanced ecosystem.

Improvements

At the Children's Zoo, several new features have been designed in conjunction with the Zoo Education Department, including exhibits for bird nests and quails, viewing platforms at the Duck Pond and Tree House, and a Desert Garden. As part of the renovation of the lowland gorillas' outdoor habitat at the Great Ape House, an artificial tree was designed that dispenses treats to gorillas who venture to climb it.

Under study are sheltered viewing areas with interpretive graphics for the North American zone and areas of Bird Valley, including the gibbon and pelican habitats on Cope Lake.

Signage, tour map, and printed materials

A new format for species identification has been adopted for use throughout the Zoo, using clear black-and-white drawings, descriptions, and maps. It replaces the system in use since the 1940s. The signs have already made their appearance in the new Seabird Colony and several other exhibitions. New interpretive graphics are also in progress for the bison range, and special signs identifying individual gorillas will be installed in the Great Ape House.

The updated tour map for visitors to the Bronx Zoo, scheduled to be printed during the summer, introduces a new concept that uses animal symbols and color-coding for easy identification of Zoo exhibitions. The map will coordinate with a new system of directional signs now being designed.

Among its assignments for printed materials, the Department designed and produced posters, promotional banners, Annual Meeting programs, brochures, and a number of other items. The staff was also responsible for the Education Department curriculum brochures and Project ZIP (Zoo Information Pack), created to aid teachers and students on field trips to the Zoo.

Exhibition construction

Two major exhibition projects under the management of the Operations Department were completed and inaugurated this spring. The 1899 Flying Cage, previously rehabilitated with City funds, was completely renovated as an exhibition for South American coastal birds, funded by the Harry De Jur Foundation. The spectacular artificial rock work was carried out by the Mervin Larson Company of Tucson, Arizona.

The Carter Giraffe Building and three adjacent outdoor African animal exhibitions were opened officially on June 9, 1982. Giraffes, zebras, slender-horned gazelles, and cheetahs now roam over several acres of plains during the summer and will be on public view in the exhibition building during the winter.

The largest current project is the exhibition work for Wild Asia Jungle World, now being constructed by the Larson Company within the building, which itself was completed in 1981. A crew of sixteen men, under the direction of the Exhibition and Graphic Arts Department, works daily with spray guns, concrete mixers, drills, and other equipment to create the diverse jungle habitats for rare tropical Asian species that will occupy the Zoo's largest building.

Behind-the-scenes projects

City-funded improvements finished during the past year include the northwest sewer-pump station, completing the Zoo's compliance with the City's anti-pollution code; the backup diesel-powered

generators for emergency use during power failures; and the hay and grain storage barn tile roof.

Other completed improvements are the dual fuel-firing boiler conversions, which provide the alternative of using gas or oil in case of shortages or drastic price differentials; the Educational Services Building in the old Zebra house; the re-roofing of the Great Ape House; the Pere David deer shelter at the Rare Animal Range; the enlargement of the interior hay and grain storage area in the Hay Barn; and the new red panda exhibit in Wild Asia.

New York City has contracted for Phase II exterior restoration of several original Zoo buildings. Under their capital improvement budget, the old Large Bird House, Zebra House, and Monkey House exteriors are being cleaned and waterproofed.

Renovation of the outdoor areas of the Great Ape House has been accomplished by the Bronx Zoo's own construction forces and exhibition staff, along with outside contractors. The old artificial surfaces have been replaced with soil and grass to make a more naturalistic habitat for the famous breeding group of lowland gorillas.

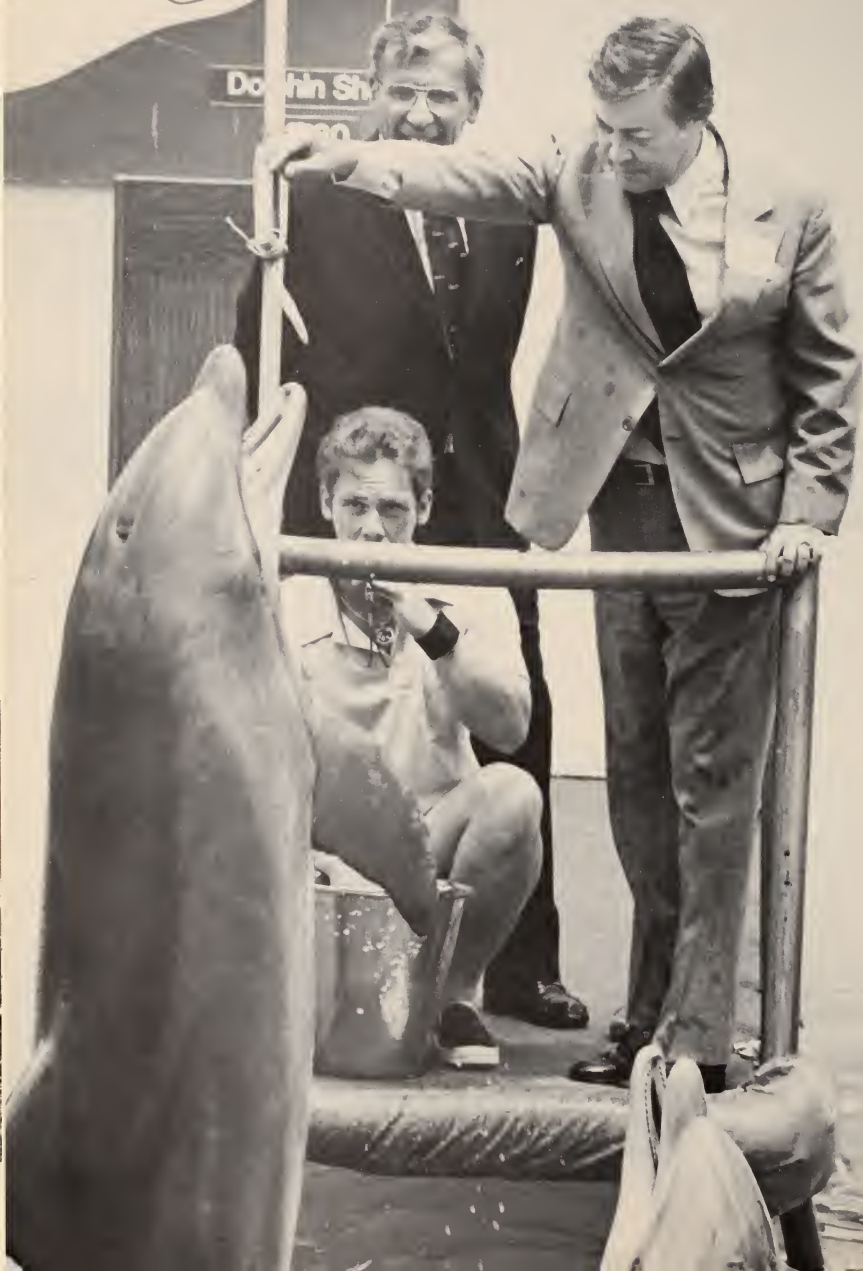
Plans and specifications have been drawn for the construction of a new citywide animal hospital. This 18,000-square-foot facility will provide the veterinary staff much needed space to care for the health of the Zoo's animals, as well as animals in the City Zoo system, and to conduct important basic and clinical research. Ground-breaking for the hospital is expected during the fall of 1982.



Meticulous craftsmanship in the fabrication of a spreading mangrove tree characterizes the ongoing exhibition work in Jungle World.

k aquan

Dolphin Show



The New York Aquarium, opened to the public in 1896, celebrated its twenty-fifth anniversary in Coney Island on June 6, 1982. Manhattan was home to the Aquarium for its first forty-five years, and the Bronx for the next sixteen, until the present facilities were established in 1957 by the sea in Brooklyn.

During its long history, the Aquarium has had a close and fascinating relationship with belugas, arctic white whales. In 1897, this aquarium was the first in the United States to exhibit these magnificent creatures. Blanchon, a beautiful male beluga, has resided here for twenty years, and the New York Aquarium is unique in the world for breeding belugas in captivity.

A beluga named Nyci was born on August 25, 1981, and because its mother refused to nurse it, the baby was fed a formula of milk, cream, powdered casein, lactaid, and vitamins four times a day by the Aquarium staff. This was the first attempt ever at hand-rearing a beluga, and although the baby lived only eight weeks, it had grown in length and weight. Much was learned that will aid in the successful raising of belugas in the future.

Marine mammal holding facility

Completion of this major project was officially celebrated on June 30, 1982, with an opening attended by Brooklyn Borough President Howard Golden, New York City Comptroller Harrison Goldin, Commissioner of Cultural Affairs Henry Geldzahler, and other dignitaries. This magnificent complex consists of two large pools holding 175,000 gallons of seawater interconnected with a smaller isolation pool for whales and dolphins; and five isolation pools with a large training pool for seals and sea lions. The holding tanks, built with funds from the City of New York, will provide space for breeding, medical treatment, and attending to beached animals. They will also serve as the support facility for the newly proposed whale-dolphin arena, an exciting new project for which the Brooklyn Borough President's office has already provided planning funds.

New exhibitions

"The seasons are the youth, maturity and old age of a never ending, still beginning Spring," Samuel Taylor Coleridge described the weather of Madeira. Others have called this volcanic island "the Pearl of the Atlantic." Madeira, known for its vineyards

and wine, fine lace and beautiful flowers, has an even richer and more exciting spectacle in the waters along its rocky shores, where an abrupt drop-off to great depths makes possible a sportfisherman's paradise of tuna, swordfish, and blue marlin. Brilliantly colored fishes, reminiscent both in shape and color of tropical reef specimens, abound inshore. This fascinating piece of the ocean has now been re-created at the Aquarium, where multi-colored peacock wrasses, scarlet cardinalfishes, parrotfishes, and rockfishes cavort in a new Madeira fish exhibition made possible by an expedition sponsored by Society Trustee Nixon Griffis.

Creatures of the Deep features sedentary marbled catsharks and the even slower-moving giant isopod. The catsharks usually reside at depths to 400 fathoms (2,400 feet) but are doing well in their specially designed exhibit. The New York Aquarium was the first to successfully exhibit the giant isopod, and has maintained them alive longer than any other institution. Specimens of these fascinating creatures were collected by Nixon Griffis and some have been sent to other aquariums for exhibition—namely, the Shedd Aquarium in Chicago and the New England Aquarium in Boston.

A special tank is being designed to facilitate successful breeding of the chambered nautilus in captivity. Nautilus have been established as a permanent exhibition since they were first collected in the deep waters off Palau in 1978, but little is known about the biology of these beautiful shelled relatives of the reclusive octopus and swift oceanic squid. Its breeding and developmental cycle has yet to be unraveled.

Women's Committee

The Women's Committee of the New York Zoological Society celebrated its tenth anniversary with a highly successful dinner-dance at the New York Aquarium on June 2, 1982. The monies raised will be used to fund planning for a novel aquatic discovery center at the Aquarium. This series of exhibitions will be designed to bring the family unit into a rewarding and intimate contact with the inhabitants of the water world.

The Andrea Doria safe

The *Andrea Doria* collided with the *Stockholm* on July 25, 1956 and sank in 240 feet of water fifty miles off the island of Nantucket. The quick sinking of this modern cruise ship became a subject of

great speculation, including the contention that watertight doors were either missing or left open. Zoological Society Advisor Peter Gimbel, his wife Elga Andersen, and a large crew of divers and underwater photographers spent a month shuttling between the wreckage and a specially controlled environment that was neither their own nor that of the sea. Earaches and respiratory distress were not uncommon in this alien, voice-distorting, helium-rich atmosphere, which acted as a way station between shipboard and the deep. A film made by Gimbel and his associates will reveal the fate of what is now the tilted hulk of the *Andrea Doria*. At the Aquarium, one of the safes from the great ship has fascinated visitors since it went on view in early September 1981. This relic of the disaster serves as a vivid symbol of an arduous and dangerous human endeavor to solve one of the mysteries of the sea.

Osborn Laboratories of Marine Sciences

It takes more than the sex chromosomal makeup to determine whether a fish will become a male or a female; another gene located elsewhere on the chromosomes plays a determinant role. Both the X and Y chromosomes appear to possess a male-

determining gene, but this gene is usually inoperative on the X chromosome. That is why the XX combination almost always gives rise to a female. Recent studies by Dr. Klaus D. Kallman, however, have shown that a rare autosomal gene can activate the male-determining gene on the X chromosome. In the presence of the autosomal gene, such an XX fish will develop into a male. This research has shown that five percent of all XX pygmy swordtail fish become males. It also provides an experimental model to explain the occurrence of XX males in other animal species, including humans.

Dr. Kallman and his co-workers have also uncovered an interesting relationship between the adult size of male pygmy swordtails and their sex chromosomal makeup. XY males are very large; but all XX males are tiny. His studies indicate that closely linked to the male gene on the X chromosome is a second gene that controls growth rate. In XX male fish the bulk of the growth hormone cells of the pituitary gland become inactive at three weeks of age. Such a fish, therefore, grows very slowly. This is the only known example in fish where major differences in growth rate are controlled by a single gene.



Circles within circles describe the new holding facility's two large holding tanks and isolation tank for whales and dolphins and the training pool and five smaller isolation pools for seals and sea lions.

Fungi are fascinating but very little is known about marine fungi. Currently three are being studied: the first may aid the creature in which it resides; the second may kill the fish it infects; and the third may prove beneficial to man.

Dr. Paul J. Cheung has noted that deep-sea giant isopods have a fungus in their intestinal tract. The fungus, however, does not appear to be an infective agent but, on the contrary, may serve a beneficial purpose. Experiments are being designed to isolate the fungus, identify it, establish its requirements, and determine its function. The isopod feeds upon dead animal life on the bottom of the ocean; the fungus may aid in the digestion process.

A newborn shark had a severe fungus infection. This fungus was isolated, cultured, and used to experimentally infect killifish. It produces a tumor-like growth and it spreads into the internal organs. The efficacy of anti-fungal agents such as Nystatin, Fungizone, and malachite green were evaluated, but only Nystatin showed some inhibitory activity.

Several marine fungi were investigated for antibacterial activity. Extracts from the marine fungus, *Pleospora pelagica*, exhibited broad-spectrum antibacterial activity. The active compound has been identified and named pelagicin. Other studies are

being planned to obtain more detailed information on its properties and antibiotic activity.

A number of marine fishes produce toxins. Two of these, the trunkfish and the oyster toadfish, secrete a mucous that is toxic to other fishes. The trunkfish mucous appears to be a neurotoxin, and a mixture of three compounds was obtained from the toadfish. Further studies will indicate the structure of the active materials and their specific modes of action.

The nautilus, whose fossil history has been traced back more than 500,000,000 years, is a slow-moving, deep-water inhabitant. Fifteen specimens are on exhibit in the Aquarium and they range in size from a juvenile of only sixty grams (the smallest live nautilus in captivity) to a giant adult weighing more than 1600 grams. Although many United States aquariums now display the nautilus, the New York Aquarium has kept them longer and is the only aquarium in America involved in research on these fascinating creatures. This research is being conducted by Professor John Chamberlain of Brooklyn College, and it focuses on four specific aspects of the animals' biology: locomotion, growth rate, buoyancy control, and shell strength. The information obtained will contribute to an understanding of the nautilus's evolutionary success.



Giant isopods are exhibited with catsharks in the new Creatures of the Deep exhibition.

Aquarium Education

Since its inception the Education Department has been committed to unfolding the wonders, complexities, and conservation aspects of the aquatic realm to an extremely diverse audience. Programs are created to encompass a broad spectrum of interests and to take into account the individual needs and reactions of Aquarium visitors. Families, which compose a substantial percentage of this audience, present special possibilities for teaching and learning that do not exist with school groups, and the education staff, in collaboration with researchers from Columbia Teachers College, has devoted a good deal of attention to this important area in recent years, with a formal relationship in terms of course credit being established in the past year. Interviews and observations have begun to yield invaluable information concerning the dynamics of family learning, and this in turn has made possible the establishment of family workshops as well as tours, special lectures, hands-on activities, and multimedia presentations that are specially tailored to the family.

New programs have also been added for school groups from kindergarten to college level, supplementing the lectures, tours, and classes that already fill the void in marine education existing in most school curricula. Almost 112,000 students in 2,725 organized groups participated in the program over the past year, and 11,957 students paid a fee

to attend audio-visual presentations, laboratory classes, behind-the-scenes tours, seafood cookery classes, sessions aboard oceanographic research vessels, and trips to South Street Seaport, Fulton Fish Market, Gateway National Park, and local salt marshes and beaches. Supporting these programs is the series of Teacher's Workshops that have trained more than 5,000 teachers to date in a subject matter that is generally unfamiliar to them.

Several programs involved partnership with outside educational institutions. Under a grant from Con Edison, the Aquarium has begun to develop curricula for inner-city students at public and parochial schools in four Brooklyn school districts focusing on various aspects of energy resources and use by humans and animals. Other programs involved Beach Channel High School and the Board of Education Training Occupational Program. Interns from five colleges and universities (Brandeis, Columbia, Southampton, Connecticut College, and St. John's) assisted with departmental programming. Finally, fifty-eight students from local high schools took part in the Aquarium's multi-faceted, on-going docent program. While assigned to answer visitor questions and assist in the Winter and Summer Camps for elementary-grade children, these students were also provided with on-the-job training and apprenticeship in aquarium management.



The white or beluga whale is one of the Aquarium's oldest and most popular inhabitants.

New York Aquarium Census (as of Dec. 31, 1981)

Phylum	Class	Order	Species	Specimens
Chordata	Chondrichthyes—Cartilaginous fishes: Sharks, rays, chimeras	Heterodontiformes—Horn sharks	1	7
		Squaliformes—Typical sharks: Sand tigers, lemons	2	11
	Osteichthyes—Bony fishes	Rajiformes—Stingrays, skates	2	8
		Acipenseriformes—Sturgeon, paddlefish	3	63
		Amiiformes—Bowfin	1	10
		Elopiformes—Tarpon, bonefish	1	2
		Anguilliformes—Eels, morays, conger eels	5	13
		Salmoniformes—Trout	2	36
		Cypriniformes—Minnows, carp	5	200
		Siluriformes—Freshwater catfishes	2	7
		Batrachoidiformes—Toadfishes	1	13
		Gadiformes—Codfishes, celpouts	1	12
		Atheriniformes—Platys, swordtails, killifish	34	382
		Beryciformes—Squirrelfishes	2	25
		Gasterosteiformes—Seahorses, pipefish	2	9
		Perciformes—Perches, sea basses, porgies, cichlids	150	700
		Pleuronectiformes—Flounders, soles	5	40
		Tetraodontiformes—Puffers, boxfish, triggerfish	10	40
		Superorder:		
		Ceratodimorpha—Lungfishes		
		Family:		
		Protopteridae—African lungfish	1	1
	Reptilia	Chelonia—Turtles	7	34
	Aves	Sphenisciformes—Penguins	1	36
		Anseriformes—Ducks	1	9
	Mammalia	Pinnipedia—Seals, sea lions	4	12
		Cetacea—Whales, dolphins	2	6
Cnidaria	Anthozoa—Corals, anemones		22	17,000 ±
Annelida	Polychaeta—Marine worms		3	20
Arthropoda	Crustacea—Lobsters, shrimps, crabs, isopods		11	85
	Arachnida—Horseshoe crabs		1	18
Mollusca	Gastropoda—Snails		4	14
	Pelecypoda—Bi-valves		2	14
	Cephalopoda—Octopus, nautilus		3	18
Echino-dermata	Asteroidea—Starfish		9	55
	Holothuroidea—Sea cucumbers		3	15
	Echinoidea—Sea urchins		3	200
Totals			306	19,115 ±



Service to the national and international community of zoological parks is routinely carried out by the many departments of the New York Zoological Society. But there is one division, the Animal Research and Conservation Center (ARC) whose entire program, aside from administration, takes place in the field, beyond the boundaries of any zoological park. The scope of ARC projects is at once a commentary on the capabilities of this unique organization, and on the boundless distribution of endangered species.

Central China, northern Australia, East Africa, South America, northern India, the Pacific, the Caribbean, the eastern Atlantic—by year's end ARC was investigating wildlife problems in all these regions. There are currently sixty-one projects underway in thirty-two sovereign states of the world.

The endangered species phenomenon appears everywhere, like a blight, although its causes are, broadly speaking, limited to two: excessive direct exploitation and habitat destruction. No country, no culture, except the most primitive and isolated, is absolved of blame. This year, as in years before, ARC representatives verified the pervasive distribution of endangered species in English, French, Spanish, Portuguese, Hindi, Swahili, Thai, Chinese, and in various dialects of each.

An annual assessment of world wildlife survival prospects is an unnerving exercise at best. There are good signs to be found. But there are many more bad ones, and there will be many more annual reports before there is a demonstrable reversal of the trends toward extinction that now grip the earth's fauna. It is against the certainty of that reversal that ARC and all conservationists continue to work.

Recovery of the giant panda

The first lengthy (eighteen month) period of field research on the giant panda is now complete. Led by ARC Director Dr. George Schaller, the project is jointly sponsored by the Chinese government and the World Wildlife Fund, International. As the fiscal year drew to a close, Dr. Schaller was beginning a report-writing phase that will be followed by more fieldwork in 1983.

Conditions for increasing the panda population from about 1,000 to more reassuring numbers are not necessarily improving. But for the first time,

data for an accurate natural history of this elusive creature are being assembled. Only with information such as that meticulously collected by Dr. Schaller will the critical management decisions called for by the unusual plight of the panda be possible.

ARC colleagues at the Bronx Zoo—Dr. Emil Dolensek, Veterinarian, and Dr. Janet Stover, Medicine Resident—have also contributed to the panda recovery effort this year by continuing to help the Chinese perfect captive propagation techniques. The several captive pandas in Chinese zoos may represent a safeguard against extinction in the wild if the behavioral idiosyncrasies associated with panda reproduction can somehow be accommodated.

Belize's barrier reef

Archie Carr, III, Assistant Director of ARC, devotes his time chiefly to administration of the overall field program (see the ARC biennial report for details of sixty worldwide projects underway or completed between 1980 to 1982). Dr. Carr also initiated a field project in the Central American country of Belize (formerly British Honduras) during the past year to improve the conservation outlook for the 150-mile-long barrier reef along Belize's Caribbean coast. To collect information for the project, a graduate student from the Yale School of Forestry and Environmental Sciences, Judy Perkins, spent six months in Belize under the dual sponsorship of ARC and the Richard King Mellon Foundation. A final report is now in preparation and negotiations have begun with the government of Belize, the International Union for the Conservation of Nature (IUCN), and UNESCO to implement conservation measures for protecting the reef and other living natural resources in the country.

The great whales

The geographic breadth of the ARC field program is such that political affairs inevitably interfere with one project or another. This year the sovereignty conflict between Argentina and Great Britain resulted, for a time, in circumstances unsuitable to maintaining the routine whale monitoring project at Peninsula Valdes, conducted by staff Research Zoologist Dr. Roger Payne. Other initiatives in Patagonia and the Argentine Andes of direct interest to William Conway, New York Zoological Society General Director and ARC Senior

Conservationist, were also temporarily tabled. Dr. Payne has concentrated on compiling and editing a volume of thirteen technical papers on great-whale biology which will include his own work plus that of Research Fellow Katharine Payne and other cetacean biologists under Dr. Payne's direction.

Also conducting significant whale research was Eleanor Dorsey, an ARC Research Fellow and former student of Dr. Payne who secured sponsorship from ARC and World Wildlife Fund, U.S. to conduct studies on the minke whale off the Pacific coast of Washington State. The work is notable as much for the methodology employed as for the expected results concerning territoriality and reproductive habits. Dorsey will now attempt to affix small radio transmitters to the whales, without injury to them, that will be capable of efficiently monitoring their movements. The research has attracted the attention of the International Whaling Commission, whose data all too frequently have relied on studies of dead whales.

Evolution in Uganda

In Uganda, Dr. Thomas Struhsaker, ARC Research Zoologist and specialist in primate biology, maintains his fifteen-year behavioral monitoring plan

for the diverse primate fauna of the Kibale Forest. During the past year he has recorded a rare instance of cross-breeding between two distinct monkey species, the red colobus and the blue monkey. The phenomenon is of interest for two reasons. First, interspecific breeding is unusual in nature, there normally being insurmountable behavioral, if not anatomical and physiological, obstacles to its occurrence. Because he has developed lengthy, detailed case histories for each of the parental lines leading to this particular cross, Dr. Struhsaker has been able to use the case as a test of basic theories of speciation. Second, he has found that the behavior of the cross-bred offspring—food selection, for example—exhibits characteristics of both parents. The observation is important because it demonstrates that behavior, or at least the nuances of behavior, can be inherited, whereas it is usually thought to be learned from parents rather than genetically transmitted to the progeny.

These rare but naturally occurring "experiments" lend great strength to evolutionary and ecological theory, but they can only be encountered and thoughtfully interpreted in cases where animal populations are monitored for lengthy periods. Under Dr. Struhsaker's investigation, the Kibale



The black-footed ferret (left), feared extinct since 1974, was rediscovered in Wyoming by the U.S. Fish and Wildlife Service in September 1981. Dr. Tim Clark's urgent work to preserve this most endangered of American mammal species is now being sponsored by ARC. This ferret was photographed at the Bronx Zoo in 1905 when the animal was already considered rare.

By accustoming herds of Nilgiri tahr to his presence and color-coding individual animals, Clifford Rice (right) has been able to more closely study their mating habits and territorial behavior and range in South India.

Forest has become a living data bank, revealing the rich subtleties of animal behavior.

Savannah ecology in Amboseli

Another ARC project of long duration is the work of Resource Ecologist Dr. David Western in Kenya. Working partly from new ARC offices in Nairobi, Dr. Western and his associates manage and monitor the wildlife of Amboseli National Park. Western himself studies the complex relationships between the vegetation of the Amboseli savannahs and the diverse herding herbivores that graze upon them. The availability of forage from one year to the next influences the abundance and health of the wildlife and is itself governed by rainfall and other environmental factors, such as competitive grazing by domestic cattle.

The principal cattle herders of the Amboseli region are the Maasai tribesmen. Their well-being, like that of the savannah wildlife, is tied to fluctuations in forage availability. A natural extension of Dr. Western's work, therefore, has been to study the pastoral methods of the Maasai. As a result, ARC has gradually amassed a complete and comprehensive picture of the interacting forces that shape the savannah ecosystem throughout East Africa.

Elephant studies in Amboseli, principally by Cynthia Moss, have continued. She, Dr. Western, Joyce Poole, and others in the Amboseli group also began work on a technical book on African elephants. It promises to become a definitive work, covering many aspects of elephant ecology and behavior.

An important capital project supervised by Dr. Western is the renovation of a complex water distribution system in Amboseli. The undertaking is made possible by contributions to ARC from the Nichols Foundation and the Little Family Foundation. It is designed to convey fresh water from springs in the heart of Amboseli to the park's perimeter as a means of preventing cattle from entering the park. First constructed in 1973, the pipe and pump system is credited with resolving the cattle-wildlife conflict in the park, and the new improvements will secure the advantages that have been gained.



Africa

- 1 Status of the giant sable antelope Richard Estes
Angola
- 2 Ecological textbook James Connor
East Africa
- 3 Zoological monitoring in Amboseli National Park David Western
Kenya
- 4 Capital improvements in Amboseli National Park D.M. Mbuvi
Kenya
- 5 Elephant social behavior in Amboseli National Park Cynthia Moss
Kenya
- 6 Crop-raiding in a population of olive baboons Shirley Strum
Kenya
- 7 Impact of Maasai pastoralism on vegetation of the Mara region Richard Lamprey
Kenya
- 8 Behavioral and environmental factors determining survival of black rhino calves Vaughn Langman
Kenya
- 9 Survey of wildlife in Bendel State John Oates
Nigeria
- 10 Mountain gorilla habitat preservation Amy Vedder & William Weber
Rwanda
- 11 Cape vulture study Joan Clare Dobbs
South Africa
- 12 Bongo research project Chris Hillman
Sudan
- 13 Ecology of the migratory white-eared kob in the Boma region John Fryxell & A.R.E. Sinclair
Sudan
- 14 Education through the African Wildlife Leadership Foundation Sandra Price
Sudan
- 15 Monitoring the Serengeti wildebeest population A.R.E. Sinclair
Tanzania
- 16 The Kibale Forest Project Thomas Struhsaker
Uganda
- 17 Human encroachment in forest reserves Karl G. Von Orsdol
Uganda
- 18 Elephant management in Luangwa Valley Dale M. Lewis
Zambia
- 19 Nile crocodile Jonathan Hutton
Zimbabwe

Asia and Oceania

- 20 Ecological requirements of the pig-nosed turtle John Legler
Australia
- 21 Status survey of freshwater turtles in northeast Asia Edward O. Moll & Romulus Whitaker
India
- 22 Study of the Bengal florican N.J. Collar
India/Nepal
- 23 Giant Panda Project George Schaller
People's Republic of China
- 24 A rare monitor lizard Walter Auffenberg
The Philippines

- 25 Ecological factors affecting the black shama's decline Perla Magsalay
The Philippines
- 26 Conservation education R. Rudran
Sri Lanka
- 27 Vocalization of humpback whales, Hawaii Peter Tyack & Jim Darling
USA
- 28 Seabird conservation, Hawaii Jonathan R. Reed & Jack P. Hallman
USA

Central America and the Caribbean

- 29 The Cat Island turtle Perran Ross
The Bahamas
- 30 Comprehensive planning Archie Carr, III
Belize
- 31 Coral barrier reef Judith Perkins & Archie Carr, III
Belize
- 32 Jaguar survey Dora Weyer
Belize
- 33 Interpretation and environmental education, Costa Rican National Park Service Mario Boza
Costa Rica





- | | | | | | |
|---|---|--|--|--|---|
| 34 American crocodile | Manley Fuller
<i>Costa Rica</i> | 43 Black-footed ferret | Timothy Clark
<i>USA</i> | 53 Pudu and huemul in the Andes | Mark C. MacNamara
<i>Chile & Argentina</i> |
| 35 Natural history text | Daniel Janzen
<i>Costa Rica</i> | 44 Red-bellied turtle conservation in Massachusetts | Terry Graham
<i>USA</i> | 54 Primates of the Apaporis River basin | Thomas Deffler
<i>Colombia</i> |
| 36 Ecology and conservation of the tapir | Keith D. Williams
<i>Costa Rica</i> | 45 Wichita Mountain bison herd of Oklahoma | Tracy S. Carter & James H. Shaw
<i>USA</i> | 55 Humboldt penguins | Coppelia Hays & Donald Bruning
<i>Peru</i> |
| 37 American crocodile at Lago Enriqueillo | John B. Thorbiarnson
<i>Dominican Republic</i> | 46 Aoudad in New Mexico | Khushal Habibi
<i>USA</i> | 56 Spectacled bear | Bernard Peyton
<i>Peru</i> |
| 38 Rio Platano Biosphere Reserve | Jeffrey Froelich
<i>Honduras</i> | 47 Minke whales off the San Juan Islands, Washington | Eleanor Dorsey
<i>USA</i> | 57 Moustached tamarin | Marleni Ramirez
<i>Peru</i> |
| 39 Sea turtle conservation | Archie Carr, III
<i>Nicaragua</i> | South America | | 58 Andean condors | Stanley Temple
<i>Peru</i> |
| Europe | | 48 Interpretation training for national park wardens | J. Douglas Culliard & Arturo Tarak
<i>Argentina</i> | 59 Predator-prey relations in neotropical forest mammals | John Terborgh
<i>Peru</i> |
| 40 International wildlife law | Simon Lyster
<i>England</i> | 49 Management and protection of Punta Tombo Reserve | William Conway
<i>Argentina</i> | 60 Orinoco crocodiles in Rio Caura, Bolivia | Richard Franz
<i>Venezuela</i> |
| North America | | 50 Southern right whales off Patagonia | Jane Moon Clark
<i>Argentina</i> | 61 The hoatzin | Stuart Strahl
<i>Venezuela</i> |
| 41 The cahow and other endangered fauna | David Wingate
<i>Bermuda</i> | 51 Lago Pozuelos National Monument | Arturo Tarak & William Conway
<i>Argentina</i> | | |
| 42 Bowhead whales in Beaufort Sea | Roger Payne
<i>Canada</i> | 52 Jaguars of the Pantanal | Howard Quigley
<i>Brazil</i> | | |

Expansion plan results

As *Animal Kingdom's* circulation rose to more than 138,000 and its participating zoological societies to thirty-two, the editorial staff continued to develop plans for expanding the magazine and putting it on a self-sustaining basis. A pilot issue, with a more elaborate format, a nearly full complement of actual articles, color illustrations, and several pages of advertising was prepared, primarily as a tool for advertising sales. An outside consulting firm then interviewed 200 people about the pilot magazine in four "upscale" shopping malls around the country. The response was enthusiastic, indicating that the project was on the right track for its large potential audience.

To test response by eliciting actual subscription sales, an agency was assigned to prepare a direct-mail promotion that focused on the new expanded *Animal Kingdom*. That test was mailed in January, and the results indicated that a market existed. However, the necessary expansion effort would require several years to complete and an investment of \$3,000,000 to \$4,000,000, possibly more. In view of the current state of the economy, it seemed imprudent to go forward with a major expansion at this time. Meanwhile, the editors will adopt a format more akin to that previewed in the pilot issue. The magazine will offer greater variety but within the limits of the existing magazine's size and budget. Several new departments will appear on a regular basis.

On the circulation side, the magazine will explore a new area: single copy sales. For the first time in its eighty-five-year history, *Animal Kingdom* will be sold nationally on newsstands. Returns from this effort will be modest initially but hold considerable promise for the future. And if there is an upturn in the nation's economy, *Animal Kingdom* will have the machinery in place to proceed with expansion.

Animal Kingdom highlights

The year's major undertaking was an investigative report in the June/July 1982 issue. "The Vicuna—Victor or Victim" examined the program to preserve an endangered species in Peru and the dilemma over whether vicunas should or should not be harvested as a national resource. Many complex issues and conflicting personalities are involved in this major controversy within the international conservation community. The report was funded in part by a grant from the Allied Foundation to the Society's Charles W. Nichols, Jr. Wildlife Conservation Publications Fund.

The August/September 1981 *Animal Kingdom* examined a domestic conflict over wildlife preservation: the struggle to prevent encroachments on the Birds of Prey Natural Area in Idaho. Other issues documented some of the leading achievements of America's zoos and aquariums: the opening of Miami's Metrozoo, the extensive penguin research and breeding programs at Sea World in San Diego, the opening of the National Aquarium in Baltimore, and the remarkable birth of a gaur to a domestic cow after a successful embryo transfer here at the Bronx Zoo.

Awards given to *Animal Kingdom* during the year were four Certificates of Merit from the Society of Publications Designers.

Photographic services

Through the work of one of its own photographers, the Society received national attention on the June cover of *LIFE* magazine, with a photo of a Bronx Zoo polar bear cub and mother taken by Dennis DeMello. Pictures by Assistant Curator Bill Meng and DeMello also appeared in the *Industrial Photography Annual* and *Photographing Nature*, a volume in the *Time/Life* photography work series. The Department supplied photos for *Newsweek*, *Natural History*, *Americas*, and numerous other major magazines and newspapers.

Meng also began experimenting with electronic equipment to create ultra-high-speed photographs of bats and a variety of birds in flight. These dramatic shots will illustrate future Society publications.

- Behler, John L.** 1981. Snakes under siege. *Defenders* 56(4): 34-37.
- _____. 1981. The Chinese alligator, a propagation success story. IUDZG Annual Conference, Washington, D.C., Sept. 27-Oct. 2.
- _____. 1981. Call of the critters. *Animal Kingdom* 85(2): 14-19.
- Brazaitis, Peter.** 1981. Maxillary regeneration in a marsh crocodile, *Crocodylus palustris*. *Journal of Herpetology* 15(3): 360-62.
- _____, and **Watanabe, Myrna E.** 1982. The doppler, a new tool for reptile hematology studies. *Journal of Herpetology* 16(1): 1-6.
- Bruning, Donald F.** 1981. Hand-rearing flamingo chicks. *American Pheasant and Waterfowl Society* 8(9): 14-18.
- _____. 1981. A New Guinea experience: Importation, propagation and cooperation. Game Bird Breeders Federation Meeting, Providence, R.I., Sept.
- _____. 1981. Rearing young South American condors. *AAZPA 1981 Annual Conference Proceedings*, pp. 136-42. New Orleans, LA, Sept. 13-17.
- _____. 1981. The World of Birds at the New York Zoo. *International Zoo Yearbook* 21: 22-24.
- _____, **Bell, Joseph**, and **Dolensek, Emil P.** 1981. Observations on the breeding of condors at the New York Zoological Park. In *Recent Advances in the Study of Raptor Diseases*, ed. J.E. Cooper, pp. 49-50. West Yorkshire, Eng.: Chiron Publications.
- Carr, Archie, III.** 1982. Strip-mining: Phosphate wastes Stephen Foster's Suwannee. *Audubon* 84(3): 109-11.
- _____. 1982. Tropical forest conservation and estuarine ecology. *Biological Conservation* 23(4).
- Cheung, Paul J.**, **Nigrelli, Ross F.**, and **Ruggieri, George D.** 1981. Development of *Oodinium ocellatum* (Dinoflagellida): A scanning electron microscopic study. *Transactions of American Microscopical Society* 100(4): 415-20.
- _____, **Nigrelli, Ross F.**, and **Ruggieri, George D.** 1981. *Oodinium ocellatum* [Brown, 1931] (Dinoflagellida) in the kidney and other internal tissues of porkfish, *Anisotremis virginicus* (L.). *Journal of Fish Diseases* 4: 523-25.
- _____, **Nigrelli, Ross F.**, and **Ruggieri, George D.** 1981. A new histozoic myxosporean parasite infecting the muscle of collar butterflyfish, *Chaetodon collar* Cope, 1877. Eastern Fish Disease Workshop, Columbus, Miss., July 21-22.
- _____, **Nigrelli, Ross F.**, and **Ruggieri, George D.** 1981. Scanning electron microscopy on *Cryptocaryon irritans* Brown, 1951, a gymnostomid ciliate parasitic in marine fishes. *Journal of Aquaculture* 11(3): 70-73.
- _____, **Nigrelli, Ross F.**, **Ruggieri, George D.**, and **Cilia, Alba.** 1982. Treatment of skin lesion in captive lemon sharks, *Negaprion brevirostris* (Poey) caused by monogeneic trematodes (*Dermophthirus* sp.). *Journal of Fish Diseases* 5(2): 167-70.
- Conway, William G.** 1981. Yuletide beeping. *Animal Kingdom* 84(6): 24.
- _____. 1981. Brave new zoo. *AAZPA 1981 Annual Conference Proceedings*, pp. 26-34. New Orleans, LA, Sept. 13-17.
- Doherty, James G.** 1981. Embryo transfer from an endangered species to a domestic species. *AAZPA 1981 Annual Conference Proceedings*, pp. 160-64. New Orleans, LA, Sept. 13-17.
- _____, and **Stover, Janet.** 1981. Manhar the Magnificent: Born with two mothers. *Animal Kingdom* 84(5): 6-12.
- _____, and **Stover, Janet.** 1982. Conservation of endangered species through embryo transfer. Annual Eastern Psychology Association Conference, Baltimore, MD.
- Dolensek, Emil P.** 1981. Zoological veterinary technology. Annual Meeting of the AZVT, Seattle, Wash., Oct.
- Duffelmeyer, Judith.** 1981. Use of the gluteraldehyde method for detection of gamma globulin in young ungulates. Annual Meeting of the AZVT, Seattle, Wash., Oct. [published in the *Proceedings* and in *New Methods: Journal of Animal Health Technology* 4(10): 10.
- Erb, Lyndall**, **Lasley, B.L.**, **Czekala, N.M.**, **Monfort, S.L.**, and **Bercovitz, A.B.** 1981. A dual radio immuno assay and cytosol receptor binding assay for the measurement of exogenous compounds applied to urine, fecal and plasma samples. *Steroids* 39(1): 33-45.
- Gillespie, James**, and **Bruning, Donald F.** 1982. Reflections on the tenth anniversary of the World of Birds. *Animal Kingdom* 85(3): N6-7.
- Hensel, Karen.** 1981. Marinating the family. *International Association of Zoo Educators Journal* 7.
- _____. 1982. Ethnographic analysis of the aquarium/zoogor. National Museum Educators Roundtable of the AAM, Washington, D.C., Mar.
- Holmstrom, William F.** 1981. Observation on the reproduction of the yellow anaconda, *Eunectes notaeus*, at the New York Zoological park. *International Zoo Yearbook* 21: 92-94.
- _____, and **Behler, John L.** 1981. Post-parturient behavior of the common anaconda, *Eunectes murinus*. *Der Zoologische Garten* 51(5/6): 353-56.
- Joanen, Ted**, **McNease, Larry**, **Tarver, Johnnie**, and **Behler, John L.** 1981. Captive propagation of alligators in Louisiana. International Herpetological Congress, Oxford, Eng., Oct.
- Kafka, Merryl.** 1982. Sharks—Facts and fantasies. In *Gateway to the Sea*. Gateway National Recreation Area and New York State Sea Grant.
- Kallman, Klaus D.**, **Margolis-Kazan, Henrietta**, **Schreibman, Martin P.**, and **Bloom, Judy L.** 1981. Pituitaries and testes of aged platyfish (*Xiphophorus maculatus*). *American Zoologist* 21: 199.
- _____, and **Bao, Isaac.** 1981. Genetic control of the hypothalamo-pituitary axis and the effect of hybridization on sexual maturation (*Xiphophorus*, Pisces, Poeciliidae). *Journal of Experimental Zoology* 220: 297-309.
- Lattis, Richard L.** 1981. Education . . . another source of revenue. *AAZPA 1981 Annual Conference Proceedings*, pp. 274-79. New Orleans, LA, Sept. 13-17.
- _____. 1981. The new Children's Zoo at the Bronx Zoo. *The Interpreter* 12(3): 14-17.
- _____. 1981. A new idea in children's zoos. *Newsletter, International Association of Zoo Educators* 7: 21-23.
- MacNamara, Mark C.** 1981. Project pudu. *Oryx* 16(2): 185-86.
- _____. 1981. Conservation of pudu and huemul in South America. IUDZG 36th Annual Conference, Washington, D.C., Sept. 27-Oct. 2.
- _____. 1982. Huemul: Deer of distinction. *Animal Kingdom* 85(2): 5-13.
- _____. 1982. Native deer research and conservation in Argentina and Chile. *AAZPA 1982 Regional Conference Proceedings*, pp. 9-13. Toronto, Ont., Mar. 7-9.
- _____, and **Kalina, J.** 1982. Time-lapse video tape recording: A technique for rapid accumulation of data for behavioral studies of captive mammals with specific reference to mother-young behavior in mouse deer, *Tragulus nupu*. *International Zoo Yearbook* 21: 207-210.
- Payne, Roger S.** 1982. New light on the singing whales. *National Geographic* 161(4): 462-77.
- Ruggieri, George D.** 1981. Marine toxins: Potential aids to human health. In *Gateway to the Sea*. Gateway National Recreation Area and New York State Sea Grant.
- Schaller, George B.** 1981. The evolution of blue sheep (*Pseudois nayaur*). In *Geological and Ecological Studies of Qinghai Xizang Plateau*, pp. 1027-30. Beijing, China: Science Press.
- _____. 1982. Giant panda project. In *World Wildlife Fund Yearbook 1980-81*, pp. 406-16. Geneva, Switz.: World Wildlife Fund International.
- _____, and **Crawshaw, P.** 1981. Social organization in a capybara population. *Saugetierkundliche Mitteilungen* 29(1): 3-16.
- Sheppard, Christine.** Breeding canvassback at Seateuk. *American Pheasant and Waterfowl Society Magazine* 82(3): 33-36.
- _____. 1982. The Field Associate Program at the New York Zoological Society. *AAZPA 1982 Regional Conference Proceedings*, pp. 63-66. Toronto, Ont., Mar. 7-9.
- Stover, Janet**, **Evans, J.**, and **Dolensek, Emil P.** 1981. Interspecies embryo transfer from the gaur to domestic Holstein. *Annual Proceedings of the AAZV*, pp. 122-24.
- Struhsaker, Thomas.** 1981. Polyspecific associations among tropical rain-forest primates. *Zeitschrift für Tierpsychologie* 57: 268-304.
- Walter, Jr., Eugene J.** 1981. Those absolute-ly amazing aardvarks. *International Wildlife* 11(4): 33-35.
- _____. 1981. Why animals behave the way they do. New York: Charles Scribner's Sons, 72pp.
- Western, David.** 1982. Perspective: How many vicuñas? *Animal Kingdom* 85(3): 16-17.
- Wharton, Danny C.** 1981. Breeding technologies: Expansion of options. *AAZPA 1981 Annual Conference Proceedings*, pp. 168-70. New Orleans, LA, Sept. 13-17.
- _____. 1982. The history of the snow leopard at New York Zoological Park. Third International Snow Leopard Symposium, Seattle, Wash., June 22-25 [published in *International Pedigree Book of the Snow Leopard* 3].



The New York Zoological Society's division of Public Affairs was created in fiscal year 1981 by the consolidation of several previously independent departments, all having to do with marketing, fund-raising, and the Society's contact with the general public. Fund-raising for the Society's budgetary and capital needs, and audience development for the Bronx Zoo and New York Aquarium, provided the principal focus for the division's activities in fiscal 1982.

Animal Kingdom campaign

The Society's capital fund-raising programs are all embraced by the Animal Kingdom campaign, and as the President has reported, the campaign reached \$16,816,000 by June 30, 1982, growing by approximately \$4,550,000 during this fiscal year. Several major contributions were pending at June 30, 1982, and it is the hope of the Board and the staff that the Animal Kingdom campaign will be complete by December 31, 1982. The goal is \$20,000,000.

In the spring of 1982, the Animal Kingdom campaign and the capital fund-raising needs of the Society, beyond those to be satisfied by the campaign, were analyzed by the staff and the Executive Committee of the Board. A long-range plan was drafted for raising capital funds in 1983 and 1984 for the exhibition and construction needs of the Bronx Zoo, the New York Aquarium, and the Central Park Zoo, and for endowing certain critical programs. The decision was made to conduct this work with an in-house staff, and the development office was strengthened as a result.

Donors to the Animal Kingdom campaign, from its inception to date, are listed on page 62 of this report. There were 112 such donors as of June 30, 1982, and the average gift to the campaign stands at \$150,000.

Budgetary funds

Capital fund-raising is essential to the Society's future, and development activities which generate funds for operating or budgetary expenses are essential to the Society's present. Working with three volunteer committees—the Development Committee, the Business Committee, and the Women's Committee—the staff coordinated efforts to generate \$2,463,000 for budgetary purposes. This amount derived from gifts made by individuals, \$755,000; from foundations, \$1,065,000; from corporations, \$643,000; and from fund-raising events, \$178,000.

Gifts made by individuals range from the seven-teen-dollar average contributed to the Animal Research and Conservation Center by direct-mail donors, to the magnanimous support of a few individual donors making unrestricted gifts for operating purposes in the range of \$50,000 to \$100,000. Two new programs were implemented this year to help the Society generate more substantial gifts from individuals for operating purposes. They are the Annual Patrons and the Friends of ARC. Both are described in the Report of the President (page 5). Generated by many means and campaigns, approximately 14,000 gifts were received during the year from individual donors.

Gifts and grants from private foundations, on the other hand, were received from 170 agencies. Sixty-one of these were new donors. Five foundation grants for budgetary purposes were received at the level of \$50,000 or more, and twenty-three were received in the range between \$10,000 and \$49,999.

Corporate gifts were received from 226 donors. Gifts of \$10,000 and more were received from 15 donors. Five corporate donors made outright gifts or gifts in kind worth \$25,000 or more. From all three sources—individuals, foundations, and corporations—the Society received over 16,000 gifts for budgetary purposes in fiscal year 1982.

In the operation of this fund-raising program, the Society conducts two direct-mail campaigns, one regional and one national; programs of cooperation and cultivation with the corporate and foundation communities; and social events and briefing sessions, totaling sixty-two in the past year, in fact.

The Women's Committee numbered 225 members at year-end. Their principal event during this fiscal year was a benefit dinner held at the New York Aquarium on June 4, 1982. More than 450 people attended this event, which raised almost \$65,000 for the planned Discovery Cove at the Aquarium. Before the end of the fiscal year, plans were already underway for the biennial Bronx Zoo benefit, which will be held in early June 1983.

Two areas of the Society's program, the Animal Research and Conservation Center and the New York Aquarium, require particular attention with regard to fund-raising. ARC has had its own development specialist for two years, and in this past fiscal year, the program raised approximately

\$692,000. This amount is included in the various figures quoted above. In the spring of 1982, the Trustees and staff decided to use the ARC model to establish a further development program for the Aquarium, and at June 30, recruiting for a new staff member, to work on Aquarium needs alone, had begun.

Membership

At the end of fiscal 1982, membership enrollment stood at 24,000, an increase of 4,900 over June 30, 1981. This growth is the result of successful direct-mail campaigns, and membership sales in the Zoo itself, which have increased 100 percent over two years ago.

As enrollment has grown, so has the contribution the program makes to the Society's operating budget. Through membership dues and generous contributions above and beyond dues, members now add over \$1,000,000 to the Society's annual income. Membership participation in Society

events increased, too; during this past year, twenty-two membership events were held, and 15,000 participants took part. The annual meeting, which took place on February 3 at Avery Fisher Hall, was attended by a standing-room-only crowd of 5,000 members and friends.

The Society's Travel Department is not operated by Public Affairs, but it serves the membership. In the past year, eighteen tours were operated by the Department, and 422 individuals traveled with Society scientists and curators to points as close as the South Street Seaport, and as far away as the Indian sub-continent.

Public Relations and Advertising

A newly formed and staffed public relations program was launched during the year. Important beginnings had been made late in fiscal 1981, and the techniques first developed then for increasing media interest in the Zoo and Aquarium and for raising the general visibility of the Society and its component parts have now been reworked and refined. The staff, working with an outside publicist, has created successful media campaigns around new exhibitions, animal births, scientific breakthroughs, and special events at the Zoo and Aquarium. During the fiscal year, the Society's news has made the front page of *The New York Times* four times, and also received cover treatment by *Life* magazine. Our more active program with regard to the press has resulted, overall, in extensive publicity.

Advertising, too, although the Society has sometimes in the past allocated more substantial funds, has never been more visible. Advertising is just one of the tools the staff is using to remind the public of the benefits of Zoo and Aquarium visits, and to increase attendance. Zoo Renaissance, both its exhibitions and its programs, continues to provide the best material for publicity and advertising, although the Zoo Celebration program now in its second season has resulted in extraordinary coverage by the print and electronic media.

Zoo Celebrations in fiscal 1982 were Elephants Galore in August, Halloween Happening in October, The Animals' Banquet in November, and The Second Annual Great Egg Event in April. These participatory events, filling the Zoo's 265 acres with educational tours, workshops, and films; with theater; with music; with art and culture, are providing the press with rich Zoo material, and they are helping in the task of conveying to the general public the good news of Zoo Renaissance.



Grumpy won the tug-of-war against Fordham's football team at the first annual celebration of "Elephants Weekend" on August 22 and 23, 1981.

Admissions, Parking, and Transportation

Attendance at the Bronx Zoo underwent its most dramatic increase in recent years, with a jump of 239,966 visitors, or fourteen percent, from 1,737,441 in 1980-81 to 1,977,407 this past year. This reflects the continuing trend toward popular recognition of the Zoo; the tremendous public response to such special events as the birth of the elephant, Astor, and to such projects as the new Children's Zoo and the Sea Lion Pool; and the publicity being generated by these and other developments. The New York Aquarium experienced a comparable rise of eleven percent, to 460,584 during the same period.

The Bengali Express guided monorail tour through Wild Asia continued to be the most popular of the Zoo's three transportation systems, with a ridership of 400,636. The Safari Tour Trains attracted 200,970, and the Skyfari aerial tramway, 319,353.

More people drove to the Zoo than ever before, as a total of 239,590 cars and buses used the parking fields during the past year. With parking capacity being exceeded on several occasions, the Society contracted with neighboring Fordham University to use its facilities during peak Zoo periods.

Food and Souvenirs

With the sharp increase in attendance and the addition of some new facilities and a broad range of products, food and souvenir sales reached an all-time high at the Zoo and Aquarium in fiscal 1982. Vintage-style portable food stations selling hand-dipped ice-cream cones and pretzels, complementing the popcorn van already instituted at the Zoo, significantly augmented revenues and visitor enjoyment. The Visitor Services Department is exploring the possibility of acquiring similar additional food stations in the near future.

Personnel

In 1981-82, the New York Zoological Society employed 859 people, with 370 of them on the full-time staff of the Bronx Zoo, the New York Aquarium, the Osborn Laboratories of Marine Sciences, the Wildlife Survival Center, and the Animal Research and Conservation Center. The wide-ranging group of permanent employees includes curators, keepers, administrators, writers, fund-raisers, designers, photographers, editors, mechanics, gardeners, attendants, security personnel, food servers, research scientists, field zoologists, construction workers, and even a zoological records specialist.

The 489 seasonal employees were employed to help operate the park from April through October. Over 400 were young New Yorkers, primarily from Brooklyn and the Bronx, where the Society remains the largest summer employer of youths, in jobs ranging from ticket-taker and tour guide to food service worker and temporary maintainer. Although funding for job programs has become scarce, the Society was able to continue participation in several employment programs involving educational, government, and corporate sponsors which offer disadvantaged and handicapped individuals a chance to enter the work force.



Helium-filled balloons are among the popular new souvenirs being sold by Zoo vendors.

During the year ended June 30, 1982, revenues for general operations and capital projects increased 18.5 percent, while expenditures for these purposes increased 17.9 percent. This enabled the Society to reduce its operating deficit to \$64,569.

Paramount in this reduction was the ongoing generosity of contributors to the Animal Kingdom campaign, which resulted in contributions and pledges of \$4,550,424. At June 30, this campaign had raised over \$16,800,000. Since its inception in 1976, the campaign has allocated approximately \$5,000,000 toward public service attendance-increasing and revenue-producing projects; in addition, it has funded a term endowment which has added more than \$2,000,000 in dividend and interest income toward operating needs.

Nearly \$7,200,000 was received in gifts and grants, the highest amount ever for one year. This year's Osborn Laboratories' testimonial dinner in Brooklyn raised more than \$100,000 for the support of marine research, and the Women's Committee pledged a total of \$600,000 toward the Discovery Cove planned at the Aquarium and the new snow leopard exhibition at the Zoo. The table below summarizes these amounts:

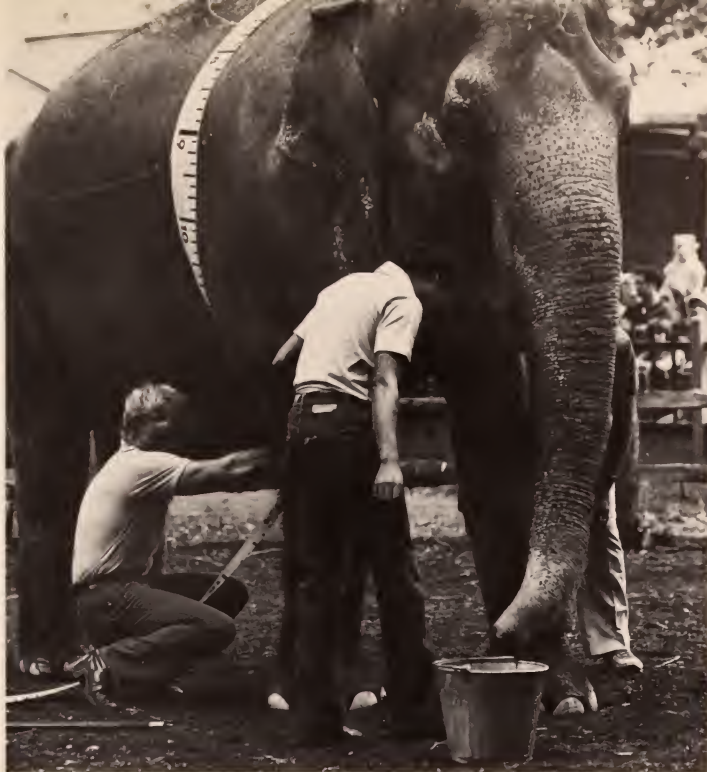
	Balance June 30, 1981	Gifts & grants	Amount expended	Balance June 30, 1982
Operating funds				
Unrestricted		\$1,253,780	\$1,253,780	
Restricted	\$1,687,341	1,389,299	1,711,203	\$1,365,437
Expiration of term endowment			1,103,953	
Subtotal		<u>\$2,643,079</u>	<u>\$4,068,936</u>	
		Outstanding pledges	Pledge collections	Outstanding pledges
Endowment funds				
Term	\$1,694,277	\$4,550,424	\$3,439,344	\$2,805,357
Income unrestricted		<u>5,000</u>	<u>5,000</u>	
Subtotal		<u>4,555,424</u>	<u>3,444,344</u>	
Total amount contributed		<u>\$7,198,503</u>		

Government support, so vital to the Society's well-being, increased 26.6 percent. The City of New York contributed \$5,388,104; the State of New York, \$1,290,200; and Federal sources, \$238,483.

The City increased its support by more than \$1,250,000. City-supported positions at the Aquarium and Bronx Zoo increased to 190, returning to the level of seven years ago. In addition \$892,000 was expended by the City toward utility costs. Federal support increased by \$140,000 as a result of a grant from the National Science Foundation to the Zoo's Education Department to develop a nationwide zoo-school curriculum known as "WIZE: Wildlife Inquiry through Zoo Education." Although direct operating expenses continued to be affected by inflation, there appear to be signs of abatement in this area. At the same time, while high interest rates have served to enhance the revenue side of the equation, the Society's financial equilibrium depends more than ever on the continuing strong support of its constituency.

A crucial element in this support is visitor attendance, which continued its upward trend of the past few years, with dramatic increases of fourteen percent at the Zoo and eleven percent at the Aquarium from fiscal 1981 to fiscal 1982. The five-year figures are as follows:

	Zoological Park		Aquarium		Combined	
Fiscal year	Visitors	Revenues	Visitors	Revenues	Visitors	Revenues
1978	1,613,617	\$ 949,706	399,388	\$ 525,466	2,013,005	\$1,475,172
1979	1,635,543	921,735	433,194	553,653	2,068,737	1,475,388
1980	1,683,249	1,143,710	423,966	559,000	2,107,215	1,702,710
1981	1,737,441	1,364,199	414,258	550,904	2,151,699	1,915,103
1982	1,977,407	1,522,431	460,584	581,161	2,437,991	2,103,592



The girth of Tus, the Zoo's largest Indian elephant, measures thirteen feet, four inches.

In addition to the increase in admission revenues, visitor services revenues were up twenty-five percent. Per capita spending at the Zoo increased to \$3.53 from \$3.26 during the previous year. The Aquarium figure decreased from \$2.49 to \$2.41. However, this reflects a greater influx of school groups, which were admitted free.

During 1982, publications revenues and expenditures rose substantially, as an intensive study and series of test mailings to determine the feasibility of launching *Animal Kingdom* magazine on a national level was completed. The new expanded format was test-marketed thoroughly in a variety of sales packages, and was very well received. However, given the difficulties experienced by others in attempting to launch new national magazines, and given the current economic picture, it was determined that such an undertaking would be inappropriate at the present time.

Membership dues increased \$306,000 and members travel program revenues \$82,000. Membership rolls grew by 4,900 and many existing members opted for higher membership dues categories. Interest in nature trips sponsored by the Society have resulted in new donors for its conservation efforts.

Although the market value of our investments declined slightly (1.5 percent on a total return basis) in the past year, dividend and investment income increased nearly \$300,000. The investment portfolio contributed \$1,614,617 and the new procedure of investing daily cash balances netted \$142,457. A fund held for the benefit of the Society by New York Community Trust contributed \$93,703.

Endowment and funds designated for long-term investment:

	Market value June 30, 1981	Market value June 30, 1982
Long-term investments	\$ 6,940,618	\$ 5,194,582
Term endowment	8,290,645	9,926,166
Endowment	4,887,936	4,464,468
	<u>\$20,119,199</u>	<u>\$19,585,216</u>

Expenditures

Society expenditures for general operations were \$20,364,575. Personnel costs were \$10,798,842 (53.1 percent); gas, electric, and fuel oil costs were \$1,173,724 (5.7 percent); and forage costs for the collections were \$577,290 (2.8 percent). Cost of goods sold for visitor service operations were \$1,091,425 (5.4 percent). Telephone (\$200,718), postage (\$276,696), and insurance (\$189,499), accounted for 3.3 percent, and the remaining 24 percent represents expenditures for professional services repairs and renovation of exhibits, supplies and materials, and replacement of equipment. Augmented efforts in the fund-raising area resulted in higher costs, but the results have certainly justified this decision.

Capital outlay

The Society opened the new Carter Giraffe Building and re-opened a dramatically renovated Flying Cage, now known as the Harry De Jur Aviary. The old Zebra House was completely renovated as an Educational Services Building, including winter back-up facilities for the new Children's Zoo. Planning and design studies for the City Zoos Project proceeded apace while plans for an entirely new animal hospital were also completed and submitted to the City for inclusion in its capital budget.

The City's capital budget provided major funds for the completion of the new Marine Mammal Holding Facility at the Aquarium and a complete reconstruction of the Whale Tank was also begun as a City capital budget project. The Society provided architectural, planning, and design costs for these projects.

Capital projects	Expended through June 30, 1981	Fiscal 1982 Expenditures	Expended through June 30, 1982
Educational Services Building & Children's Zoo	\$1,635,337	\$ 361,186	\$1,996,523
Carter Giraffe Building	1,647,869	600,258	2,248,127
City Zoos Project	283,806	478,629	762,435
Discovery Cove		1,322	1,322
DeJur Aviary*	166,150	198,334	364,484
Jungle Building*	102,819	706,190	809,009
Animal Hospital*		267,610	267,610
Marine Mammal Holding Facility*	184,437	97,299	281,736
Whale Tank reconstruction*		1,924	1,924
Subtotal	<u>\$4,020,418</u>	<u>\$2,712,752</u>	<u>\$6,733,170</u>
Animal acquisitions		<u>115,924</u>	
Total fiscal year expenditures		<u>\$2,828,676</u>	

*Capital projects undertaken jointly with the City of New York through its capital budget and Federal public works funds account for \$9,800,000 in addition to the Society expenditures detailed above.

Outlook

The past year has been a successful one. Our revenue-producing operations made substantial gains and governmental support increased in response to inflation-related costs, providing crucial base operating support for our living collections.

Many important and productive programs, however, can only be undertaken after the necessary funding has been procured. The exciting City Zoos Project is now taking shape, offering new opportunities for the Society to provide further public service. New exhibitions and major renovations are planned at both the Zoo and the Aquarium. These programs are bold, but necessary, even in today's troublesome economic climate, as the Society continues its commitment to wildlife and to the public through intelligent and forward-reaching exhibitions, research, and conservation.

David T. Schiff
Treasurer

Peat, Marwick, Mitchell & Co.

The Board of Trustees
New York Zoological Society

We have examined the balance sheet of New York Zoological Society as of June 30, 1982 and the related statements of support and revenue, expenditures, capital additions and changes in fund balances and of changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As explained in note 1 to the financial statements, expenditures for land, buildings and equipment are not capitalized, and depreciation of buildings and equipment is, therefore, not recorded. Such practices are not in accordance with generally accepted accounting principles.

In our opinion, except for the effect on the financial statements of the matter discussed in the preceding paragraph, the aforementioned financial statements present fairly the financial position of New York Zoological Society at June 30, 1982 and the results of its operations and the changes in its financial position for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Peat, Marwick, Mitchell & Co.
September 15, 1982

New York Zoological Society Balance Sheet June 30, 1982

Assets	Operating funds	Endowment funds
Cash (including commercial paper of \$1,700,000)	\$ 2,810,978	—
Investments (note 2)	5,543,313	14,467,444
Accounts receivable	649,588	—
Grants receivable (note 3)	908,158	—
Inventories, at lower of cost or market	486,447	—
Prepaid expenses and deferred charges	317,274	—
	<u>\$10,715,758</u>	<u>14,467,444</u>
Liabilities and fund balances		
Accounts payable and accrued expenses	1,558,869	—
Accrued employee benefit costs	677,440	—
Deferred support and revenue—restricted (note 6)	2,016,109	—
	<u>4,252,418</u>	<u>—</u>
Fund balances:		
Unrestricted:		
Designated for long-term investment	5,222,309	—
Undesignated	1,241,031	—
Endowment:		
Income unrestricted	—	2,679,318
Income restricted	—	1,808,978
Term endowment—income unrestricted	—	9,979,148
	<u>6,463,340</u>	<u>14,467,444</u>
	<u>\$10,715,758</u>	<u>14,467,444</u>

See accompanying notes to financial statements.

Statement of Support and Revenue, Expenditures, Capital Additions, and Changes in Fund Balances
Year ended June 30, 1982

	Operating funds			Endowment funds
	General	Capital outlay	Total	
Operating support and revenue:				
Contributions and fund raising events, net (note 4)	\$ 2,894,342	1,174,594	4,068,936	—
Fees and grants from governmental agencies	6,916,787	—	6,916,787	—
Admission charges	2,103,592	—	2,103,592	—
Visitor services revenues	4,421,278	1,572,091	5,993,369	—
Membership dues and travel	997,439	—	997,439	—
Endowment and other investment income	1,790,682	8,473	1,799,155	—
Pension fund revenues (note 5)	200,000	—	200,000	—
Publications and related revenues	642,588	—	642,588	—
Education program revenues	135,536	—	135,536	—
Collection sales	—	73,518	73,518	—
Miscellaneous revenue	197,762	—	197,762	—
Total operating support and revenue	20,300,006	2,828,676	23,128,682	—
Expenditures:				
Program services:				
Zoological Park	8,146,751	1,859,540	10,006,291	—
Aquarium	1,888,845	129,321	2,018,166	—
Survival Center	175,796	—	175,796	—
Animal Research and Conservation Center	972,269	—	972,269	—
Marine Sciences	273,983	—	273,983	—
Publications	1,143,318	—	1,143,318	—
Visitor services and admissions	4,434,677	361,186	4,795,863	—
Membership activities	686,423	—	686,423	—
City Zoos project (note 9)	—	478,629	478,629	—
Total program services	17,722,062	2,828,676	20,550,738	—
Supporting services:				
Management and general	1,675,265	—	1,675,265	—
Fund raising	967,248	—	967,248	—
Total supporting services	2,642,513	—	2,642,513	—
Total expenditures	20,364,575	2,828,676	23,193,251	—
Excess of expenditures over operating support and revenue, carried forward	(64,569)	—	(64,569)	—

Statement of Support and Revenue, Expenditures, Capital Additions, and Changes in Fund Balances (cont'd.)

	Operating Funds			Endowment funds
	General	Capital outlay	Total	
Excess of expenditures over operating support and revenue, brought forward	\$ (64,569)	—	\$ (64,569)	—
Bequests	31,980	—	31,980	—
Realized net gain on investments	3,867	—	3,867	—
Excess (deficiency) of support and revenue over expenditures before capital additions	(28,722)	—	(28,722)	—
Capital additions (deductions):				
Contributions	—	—	—	3,444,344
Realized net gain on investments	—	—	—	7,421
Total capital additions	—	—	—	3,451,765
Excess (deficiency) of support and revenue over expenditures after capital additions	(28,722)	—	(28,722)	3,451,765
Fund balances at the beginning of year (note 8)	6,492,062	—	6,492,062	12,119,632
Other changes:				
Expiration of term endowment (note 4)	—	—	—	(1,103,953)
Fund balances at end of year	<u>\$ 6,463,340</u>	<u>—</u>	<u>6,463,340</u>	<u>14,467,444</u>

See accompanying notes to financial statements.



Slender-horned gazelles of the northern Sahara, bred at St. Catherine's Island, are now on view near the Carter G. G. Building.

Statement of Changes in Financial Position
Year ended June 30, 1982

	Operating funds	Endowment funds
Resources provided:		
Excess (deficiency) of support and revenue over expenditures before capital additions	\$ (28,722)	—
Capital additions:		
Contributions	—	3,444,344
Realized net gains on investments	—	7,421
Excess (deficiency) of support and revenue over expenditures after capital additions	(28,722)	3,451,765
Items which do not provide resources—realized net gain on investments	(6,235)	(7,421)
Decrease in accounts receivable	99,889	—
Proceeds from sale of investments	17,330,057	41,415,897
Increase in accounts payable and accrued expenses	373,725	—
Increase in accrued employee benefit costs	116,586	—
Total resources provided	17,885,300	44,860,241
Resources used:		
Increase in grants receivable	238,139	—
Increase in inventories	191,491	—
Increase in prepaid expenses and deferred charges	166,828	—
Decrease in deferred restricted support and revenue	131,518	—
Purchase of investments	16,131,387	43,756,288
Total resources used	16,859,363	43,756,288
Other changes:		
Expiration of term endowment	—	(1,103,953)
Increase in cash	\$ 1,025,937	—

See accompanying notes to financial statements.

Notes to Financial Statements
June 30, 1982

(1) Summary of significant accounting policies

The financial statements of the Society have been prepared on the accrual basis except for depreciation as explained below. Other significant accounting policies follow:

Fund accounting

In order to ensure observance of limitations and restrictions placed on the use of available resources, the accounts are maintained in accordance with the principles of fund accounting. This is the procedure by which resources for various purposes are classified for accounting and reporting purposes into funds established according to their nature and purposes. Separate accounts are maintained for each fund; however, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups.

(continued)

Notes to Financial Statements (continued)

The assets, liabilities and fund balances of the Society are reported in two self-balancing fund groups:

Operating funds, which include unrestricted and restricted resources:

—Unrestricted funds represent the funds available for the support of Society operations.

—Funds restricted by the donor, grantor, or other outside party for particular operating purposes (including accessions and other capital additions) are deemed to be earned and reported as revenues of operating funds when the Society has incurred expenditures in compliance with the specific restrictions. Such amounts received but not yet earned are reported as restricted deferred amounts.

Endowment funds, which include the following restricted resources:

—Funds that are subject to restrictions of gift instruments requiring in perpetuity that the principal be invested and only the income be used.

—Term endowment funds which must be held intact except that, at some future date or specified occurrence, some portion or all of the principal may be used [see note 4].

Plant assets and depreciation

Expenditures of operating funds for plant acquisitions including buildings and improvements constructed on land owned by the City of New York are not capitalized, and accordingly depreciation is not recorded in the Society's financial statements.

Collections

Expenditures for collections are not capitalized.

Other matters

All gains and losses arising from the sale, collection or other disposition of investments and other noncash assets are accounted for in the fund that owned the assets. Ordinary income from investments, receivables, and the like is accounted for in the fund owning the assets, except for income derived from investments of endowment funds, which is accounted for, if unrestricted, as revenue of the unrestricted operating fund or, if restricted, as deferred amounts until the terms of the restriction have been met.

Enforceable pledges for operating purposes, less an allowance for uncollectible amounts, are recorded as receivables in the year made. Pledges for support of current operations are recorded as operating fund support. Pledges for support of future operations are recorded as deferred amounts in the operating fund. Pledges to the term endowment fund are recognized upon payment of the pledge.

(2) Investments

Investments are reflected at cost or fair market value at date of gift. The market value and carrying value of investments by fund at June 30, 1982 were as follows:

	Market value	Carrying value
Operating funds—expendable	\$ 5,636,071	5,543,313
Endowment funds—nonexpendable	14,268,444	14,467,444
	<u><u>\$19,904,515</u></u>	<u><u>20,010,757</u></u>

Details of investment assets at June 30, 1982 were as follows:

	Market value	Carrying value
Cash	\$ 262,502	\$ 262,502
Short-term investments	2,663,000	2,663,000
Corporate stocks	10,856,493	11,064,953
U.S. Government obligations	6,122,520	6,020,302
	<u><u>\$19,904,515</u></u>	<u><u>\$20,010,757</u></u>

(continued)

Notes to Financial Statements (continued)

Investment assets of endowment funds and operating funds are pooled on a market value basis with each individual fund subscribing to or disposing of units on the basis of the value per unit at market value, determined quarterly. Of the total units, each having a market value of \$156.64, 91,088 units were owned by the endowment funds and 35,980 units were owned by operating funds at June 30, 1982. The average earnings per unit, exclusive of net gains, approximated \$12.62 for the year.

The following tabulation summarizes changes in relationships between carrying values and market values of investment assets:

	Market values	Carrying value	Net gains (losses)	Market val- ue per unit
End of year	\$19,904,515	20,010,757	(106,242)	156.64
Beginning of year	20,807,310	18,855,380	1,951,930	173.39
Unrealized net losses for the year			(2,058,172)	
Realized net gains for the year			13,656	
Total net losses for the year			<u>\$(2,044,516)</u>	<u>16.75</u>

The New York State Not-for-Profit Corporation Law, which became effective on September 1, 1970, permits the use of realized gains on investment transactions of endowment funds. Such gains are currently being added to principal but may be utilized at the discretion of the Board of Trustees.

(3) Grants receivable

Grants receivable of the operating funds represent amounts pledged to the Society for certain operations and for the completion of particular projects in future years. Certain grants are expected to be collected, as expenditures for those projects are made by the Society.

(4) Term endowment

During 1976, the Society initiated a capital funds campaign. The campaign included a term endowment fund to serve various functions, as described below, subject to the following conditions:

- (a) The income of the term endowment fund shall be used for the general operating purposes of the Society; and
- (b) The principal of the term endowment fund may be expended only upon the affirmative vote of two-thirds of the Trustees present at any duly held meeting of the Board of Trustees or its Executive Committee (i) to finance programs or improvements to facilities (i.e., the Bronx Zoo, the New York Aquarium, or other facilities of the Society) to produce revenue or increase attendance, or (ii) to ensure the survival of the Society if funds from other sources fail to provide sufficient revenue to maintain the Society's programs; provided, however, that in the case of any contribution to the term endowment fund which was subject to a restriction not to expend the principal of such contribution without the prior consent of the donor thereof, in addition to the vote of the Trustees described above, such consent must be obtained in writing prior to the expenditure of such principal. For the year ended June 30, 1982, the Society recognized as operating support and revenue expired term endowments aggregating \$1,103,953. Such funds were utilized as follows:

Discovery Cove	\$ 1,322
Energy survey	2,625
Marine Mammal Holding Facility	97,299
Animal Kingdom Magazine	254,544
Animal Hospital	267,610
Whale Tank reconstruction	1,924
City Zoos Project	478,629
Total	<u>\$1,103,953</u>

Pledges to the term endowment fund aggregating approximately \$2,800,000 are due to be collected as follows:

Fiscal year	Amount
1983	\$1,800,000
1984	850,000
1985	150,000

(continued)

Notes to Financial Statements (continued)

(5) Pension plan

All eligible Society employees are members of the Cultural Institutions Retirement System's (CIRS) Pension Plan. Pension expense was approximately \$800,000, of which approximately \$409,000 was financed by an appropriation from the City of New York. The current year's provision includes amortization of prior service costs over a period of 30 years commencing June 30, 1974. The Society's policy is to fund pension cost accrued and no unfunded vested benefits existed as of June 30, 1981, the date of the latest plan valuation.

Because the CIRS plan is a multi-employer plan, certain information as it relates to vested and non-vested benefits as well as plan assets is not readily available.

Certain employees of the Society were formerly participants in the Society's pension fund. Effective January 1, 1975, benefits of the CIRS Plan were substituted for benefits previously accrued under the Society's pension fund. The market value of the assets of the pension fund approximated \$1,700,000 as of June 30, 1982 and exceeded the past service liability associated with the participants of the former plan. It is intended that these assets be used to fund current pension costs. During 1982, \$200,000 was used for pension payments and is reflected as revenue in operating funds.

(6) Deferred restricted support and revenue

The changes in deferred restricted support and revenue for the year ended June 30, 1982 are as follows:

Balance at beginning of year	\$2,147,627
Additions:	
Contributions and fund raising events	1,389,299
Fees and grants from governmental agencies	243,392
Investment income	228,119
Net gain on investment transactions	2,368
Other	156,607
	<u>4,167,412</u>
Less funds expended during year	<u>2,151,303</u>
Balance at end of year	<u><u>\$2,016,109</u></u>

(7) Collections

During the year ended June 30, 1982, accessions of collections aggregated approximately \$116,000 while deaccessions aggregated approximately \$74,000.

(8) Trust funds

The Society is the ultimate beneficiary under a trust held by Community Funds, Inc. of New York, N.Y. The income arising from the investments of the principal is paid to the Society for operating purposes and in fiscal 1982 amounted to \$94,000.

(9) City Zoos Project

The Society and the City of New York have entered into agreements with respect to the Central Park Zoo, Prospect Park Zoo, and Flushing Meadows Zoo. Each agreement provides for the City's renovation of these zoos at the City's expense in accordance with plans developed by the Society and approved by the City, and thereafter, for the Society's operation and management of each with funding from the City, for an initial 50-year term, renewable by the Society for five additional 10-year terms.

The Society is developing renovation plans and estimates of required funding for their complete renovation. The Society has agreed to contribute up to \$1,000,000 toward developing a renovation plan for the Central Park Zoo. Through June 30, 1982, the Society had expended approximately \$750,000 for this purpose.

Contributions, Pledges, and Payments on Pledges of \$1,000 and Over

Individuals and Foundations

Louis & Anne Abrams Foundation, Inc
The Achelis Foundation
AKC Fund, Inc
Caroline R. Alexander
Douglas B. Alexander
The Arkville Epfl Fund, Inc
Mrs. Vincent Asior
The Vincent Astor Foundation
The George F. Baker Trust
Lorraine W. Bardsley
J.M.R. Barker Foundation
The Barker Welfare Foundation
The Theodore H. Barth Foundation
The Fredrick W. Beinecke Fund
George P. Bent, 2nd
Joseph G. Bradley
The Louis Calder Foundation
Guy F. Cary
Centennial Foundation
The Clark Foundation
Francis X. Jr. & Agnes C. Coleman Fund
The Connemara Fund
Mrs. Arthur Cowen
Charles E. Culpeper Foundation, Inc.
Constans-Culver Foundation
The Dammann Fund, Inc.
Harry De Jur Foundation, Inc.
The Max and Victoria Dreyfus Foundation,
The Doris Duke Foundation
The Dunlevy Milbank Foundation
Virginia Dwan
The Dyson Foundation
John Elliott, Jr.
Blanche T. Enders Charitable Trust
Ostrom Enders
The T.M. Evans Foundation
Mrs. William Ward Foshay
Foundation for the Needs of Others, Inc
The Helen Clay Frick Foundation
Henry Clay Frick II
Louis Gargulo
Mrs. Paul E. Geier
Estate of Paul E. Geier
Anne C. Getty
Mr. and Mrs. Peter R. Gimbel
Mr. and Mrs. George D. Gould
Edmund Greco
The Greenwall Foundation
The William and Mary Greve Foundation, Inc
The Griffis Foundation, Inc
Mary Livingston Griggs and Mary Griggs
Burke Foundation
GTD Holdings, Inc
The Paul Guenther Fund
Mr. and Mrs. Alexander S. Haig
Evelyn A. Jaffe Hall Charitable Trust
Clady F. Harriman
Mary W. Harriman Foundation
Margaret Milliken Hatch Charitable Trust
William Randolph Hearst Foundation
The Heckscher Foundation for Children
Justus Heimans Foundation
Audrey P. Holden Charitable Trust
Janet A. Hooker Charitable Trust
Mr. and Mrs. Jack R. Howard
Estate of Sarah H. Ingram
John N. Irwin II
Gilbert F. Jones
Mrs. L. Emery Katzenbach
John L. Kemmerer, Jr.
Kerry Foundation, Inc
Killok Fund
J. M. Kirby Foundation, Inc
Robert J. Kieberg, Jr. &
Helen C. Kieberg Foundation
Frank Y. Larkin
Mrs. Harold Lato

Alexander M. & Judith W. Laughlin
Foundation
L.A.W. Fund
John E. Leslie
The Charles A. Lindbergh Fund, Inc
Royal Little
Little Family Foundation
Mr. and Mrs. John H. Livingston
Laurence D. Lovett
The Joe and Emily Lowe Foundation
Atholl McBean Foundation
Edith McBean
Peter McBean
John S. McIlhenny
Walter S. McIlhenny
The McIntosh Foundation
Mrs. Joseph V. McKee
The Mandeville Foundation, Inc
Beatrice C. Manice
Louise C.F. Marshall
Michael T. Martin
Townsend B. Martin
The Joseph Martinson Memorial Fund
Otto Marx, Jr.
Mr. and Mrs. John Mayer
Mrs. Paul Mellon
Mr. and Mrs. John Daniel Mitchell
William T. Morris Foundation, Inc
Henry and Lucy Moses Fund, Inc.
The Mulber Fund
The Vincent Mullord Foundation
Muskiwinni Foundation
Gertrude Muss
Mr. and Mrs. Charles W. Nichols, Jr.
Nichols Foundation, Inc
Edward John Noble Foundation
The Norcross Wildlife Foundation, Inc.
Jessie Smith Noyes Foundation, Inc
Mr. and Mrs. George D. Olds III
Ruth Norton Oliver
Mr. and Mrs. Augustus G. Paine
George Eustis Paine
Lucile B. and Marcel A. Palmato Fund
The Perkin Fund
Mr. and Mrs. Milton Petrie
Mr. and Mrs. Howard Phipps, Jr.
Howard Phipps Foundation
John H. Phipps
The Ponagansett Foundation, Inc
The Mrs. Cheever Porter Foundation, Inc

Mrs. Samuel P. Reed
Mrs. William C. Ridgway
The Gerald and May Ellen Ritter
Memorial Fund
Laurence S. Rockefeller
The Rockefeller University
Mrs. Axel G. Rosin
George D. Ruggieri, S.J.
Sasco Foundation
The Schiff Foundation
Estate of Leland T. Shafer
Shikar Safari Club International
Foundation
The Sidney, Milton and Leoma Simon
Foundation
Abby R. Simpson
Marilyn M. Simpson Charitable Trust
Mrs. Joseph R. Siphron
Mr. and Mrs. Alexander B. Slater
The South Branch Foundation
Nate B. and Frances Spingold Foundation
The Seth Sprague Educational and
Charitable Foundation
Chauncey D. Stillman
Dr. Margaret Olds Strahl
Mrs. Arthur Hays Sulzberger
Sylvanus Charitable Trust
Mr. and Mrs. Vernon Taylor, Jr.
The Tebil Foundation, Inc
Estate of Marion F. Tieman
Mrs. ch Foundation
Alice Tully
Union Foundation
Mr. and Mrs. Robert Vanderbilt
The G. Unger Vetlesen Foundation
The Laura B. Vogler Foundation
Mrs. Milo Waldes
The Natalie P. Webster Trust
Frank Weedon
Mrs. George Weiss
The Robert and Marilyn Wilson Foundation
Robert Winthrop Charitable Trust
Nicholas D. Zigo
Zoological Society of Philadelphia
Four anonymous donors

Annual Patrons

Lynn Ahrens
Charles Allen, Jr.
Mr. and Mrs. K. Tucker Anderson
Mr. and Mrs. Rand V. Araskog
Mrs. Vincent Astor
Mrs. Louis Cecil Baker (Founder)
Richard T. Baum
Mrs. F. Henry Berlin
Mrs. Harry Payne Bingham
Mr. and Mrs. H. Gerard Bissinger, III
Mr. and Mrs. Robert E. Blum
Eleanor P. Bosworth
Mr. and Mrs. David A. Botwinik
Mr. and Mrs. Henry C. Breck
Georgiana E. Brooks
Mrs. Jackson Burke
Douglas Bushnell and Betty Wold Johnson
Frank Butterworth, Jr.
Mrs. James Walter Carter
Mr. and Mrs. John Chancellor
Mr. and Mrs. Daniel R. Childs
Mrs. Frederick Childs
Mr. and Mrs. Stewart B. Clifford
Mrs. James V. Coleman
Mrs. John T. Connor
Mr. and Mrs. Alfred J. Coyle
Mr. and Mrs. Earle M. Craig, Jr.
Mrs. J. Randall Creed
Mr. and Mrs. Charles A. Dana, Jr.
Lillian Butler Davey
Michel David-Weill
Marion Ellenberg De Jur



Astor meets his namesake, Mrs. Vincent
Astor, in Wild Asia.

Margarita V. Delacorte
George J. Delaney
Dr. and Mrs. George de Menil
Mr. and Mrs. Martin Diamond
Douglas Dillon
Nelson Doubleday
R.H. Durst
Mr. and Mrs. John Elliott, Jr.
Ostrom Enders
Ms. and Mrs. James H. Evans
C. Sims Farr
Bernard Fein
Mr. and Mrs. William Ward Foshay
Mrs. Haebler Frantz
Dr. and Mrs. Henry Clay Frick II
Mrs. Paul E. Geier
Anne C. Getty
Mr. and Mrs. Richard Gilder, Jr.
Mrs. Bernard F. Gimbel
Mr. and Mrs. Peter R. Gimbel
Francis Goelt
Mr. and Mrs. Robert G. Goelt
Mr. and Mrs. William T. Golden
Charles Goulandris
Mr. and Mrs. George D. Gould
Dr. and Mrs. Robert Greenberg
Mr. and Mrs. Paul R. Greenwood
Mr. and Mrs. Gilbert M. Grosvenor
Mrs. John Hammond (Founder)
Mr. and Mrs. Rondel Harper
Mrs. Alfred C. Harrison
Robert V. Hatcher, Jr.
Iola S. Haverstick
Mr. and Mr. S. Alexander Haverstick, III
Daniel P. Hays
J.C. Head
Mr. and Mrs. H.J. Heinz, II
Mr. and Mrs. Andrew Heiskell
Charles F. Henderson
Katharine Hepburn
Joyce Hergenhan
Mr. and Mrs. Philip T. Hess
Mr. and Mrs. Peter C.R. Huang
John P. Humes
Mr. and Mrs. John N. Irwin II
Peter Iselin
Mrs. John Kean
John L. Kemmerer, Jr.
Mrs. David O'D. Kennedy
Mr. and Mrs. Milton A. Kimmelman
Mr. and Mrs. John M. Kingsley
Mrs. Garrett Kirk, Jr.
Olga H. Knoepke
Mrs. Gerard B. Lambert
Mr. and Mrs. John E. Leslie
Dr. Judith S. Levinson
Rose-Marie Lewent
Laurence D. Lovett
Dan W. Luikin
Mr. and Mrs. David Hunter McAlpin
(Founder)
Neil A. McConnell
John S. McIlhenny
Michael T. Martin
Mr. and Mrs. William McChesney Martin, Jr.
Mr. and Mrs. Otto Marx, Jr.
Mrs. Edward J. Mathews
Louise Melhado
Lu Esther Mertz
Mrs. Richard Metz
Peter Monroe
Mr. and Mrs. Henry S. Morgan
John P. Morgan, II
Mrs. Thomas Morrison
Mr. and Mrs. Emil Mosbacher, Jr.
Mr. and Mrs. Roy R. Neuberger
Mr. and Mrs. Benjamin Neuwirth
Mr. and Mrs. Charles W. Nichols, Jr.
Mr. and Mrs. Augustus G. Paine

Mrs. Marcel A. Palmaro
Louise D. Peck
William C. and Terry C. Pelster
Mrs. G.W. Perkins
Mr. and Mrs. Milton Petrie
Mrs. Jessie E. Phillips
Mr. and Mrs. Howard Phipps, Jr.
Mr. and Mrs. John H. Phipps
Mr. and Mrs. John Pierpont
Mr. and Mrs. Sumner Pingree, III
Mr. and Mrs. Harold Prince
Mr. and Mrs. John L. Procope, Jr.
Mrs. Eugene C. Pulliam
Mr. and Mrs. Richard I. Purnell
Mrs. Sarah B. Randolph
Deborah E. Wiley Raybin
Mr. and Mrs. Samuel P. Reed
Willis L. Reese
Mr. and Mrs. Harmon L. Remmel
Mrs. Henry Hart Rice
Mr. and Mrs. David Rockefeller
Mr. and Mrs. Laurance S. Rockefeller
Sascha Rockefeller
Joseph Rosen
Mr. and Mrs. Milton F. Rosenthal
Arthur Ross
Mr. and Mrs. Guy Rutherford
Arnold Scaasi
Mr. and Mrs. David T. Schiff
Mr. and Mrs. John M. Schiff
Mr. and Mrs. Peter G. Schiff
Harold Schutz
Joan Chanin Schwartz
John Julian Scott
Mrs. William I. Spencer
Chauncey D. Stillman
J.C. Sturgess
Mr. and Mrs. Stuart Symington
Mrs. Jeff Tarr
Mrs. Reese H. Taylor
Mr. and Mrs. Walter C. Teagle III
Clare Eddy Thaw
Mrs. Landon K. Thorne, Jr.
David M. Tobey
Alice Tully
Suzanne Van Matre
Mrs. John Vaneck
Saul Waldman
Alexander Weber
Mrs. Alexander White
Ann Meyers Williams
Mrs. Edward P. Williams
William E. Willis
Mr. and Mrs. Henry S. Ziegler

Individual and Foundation

Gifts-in-Kind

Mary Braga
Ida Coppola
Department of Cultural Affairs
The Griffls Foundation, Inc.
Edith McBean

Corporations

ACF Foundation, Inc.
Allied Corporation
Allied Foundation
AMAX Foundation, Inc.
American Express and Fireman's Fund
Insurance Company Foundation
American Reinsurance Company
American Standard Foundation
American Telephone and Telegraph Co.
H.L. Bache Foundation, Inc.
Bankers Trust Company
The Siegrried and Josephine Bieber
Foundation
Block Drug Company
Bloomingdale's

Booz-Allen & Hamilton, Inc.
The Robert Bowne Foundation, Inc.
Bristol-Myers Fund
Bunge Corporation
Celanese Corporation
The Chase Manhattan Bank, N.A.
Chemical Bank
Chesbrough-Pond's, Inc.
The Chubb Corporation
Citibank, N.A.
The City Investing Company Foundation
Coach Leatherware Company, Inc.
Coca-Cola, USA
Consolidated Edison Company of New
York, Inc.
Constans-Culver Foundation
Coopers & Lybrand
Corporate Property Investors
Crum & Forster Foundation
D'Agostino Supermarkets - Buy Low
Grocery Co., Inc.
The Dammann Fund
Dancer Fitzgerald Sample, Inc.
Deloitte Haskins & Sells
Dollar Savings Bank of New York
Doubleday & Company, Inc.
The Dover Fund, Inc.
Doyle Dane Bernbach, Inc.
The Dun & Bradstreet Corporation
Foundation
The T. M. Evans Foundation
Exxon Corporation
Exxon Education Foundation
Freepart-McMoran, Inc.
General Foods Corporation
GK Technologies Foundation, Inc.
Grace Foundation, Inc.
Great Lakes Carbon Corporation
Grumman Corporation
The Guinzburg Fund
Gulf + Western Industries, Inc.
Handy & Harman Foundation
Harcourt Brace Jovanovich, Inc.
Justus Heijmans Foundation
The Hennessy Foundation, Inc.
Inco United States, Inc.
International Business Machines Corporation
International Paper Company Foundation
International Telephone & Telegraph
Corporation
Johnson & Higgins
Lehman Brothers Kuhn Loeb Incorporated
Lever Brothers Company Foundation, Inc.
Thomas J. Lipton Foundation, Inc.
McCann-Erickson Worldwide
McGraw-Hill Foundation, Inc.
Macy's New York, Inc.
Main Hurdman
Manufacturers Hanover Foundation
Marsh & McLennan Companies, Inc.
The Merck Company Foundation
Metropolitan Life Foundation
Mobil Foundation, Inc.
Morgan Guaranty Trust Company of
New York
Morgan Stanley Foundation
National Distillers and Chemical Corporation
Neuberger & Berman
New York Clearing House Association
New York Telephone Company Foundation,
Inc.
New York Times Company Foundation, Inc.
North American Phillips Corporation
North American Reinsurance Corporation
Ogden American Corporation
Ogilvy & Mather International, Inc.
Owens-Corning Foundation, Inc.
Peat, Marwick, Mitchell & Co.
Penn Central Corporation
J.C. Penney Company, Inc.



City Council President Carol Bellamy at the Carter Giffls Building.

The Perkin-Elmer Corporation
The Sanky Perlowin Company
The Pfizer Foundation, Inc.
Philip Morris Incorporated
Mary Jane Pool
Price Waterhouse & Company
The Prudential Foundation
RCA
Reliance Financial Group
Revlon Foundation, Inc.
Rockefeller Center, Inc.
Rogers & Wells
Helena Rubinstein Foundation, Inc.
The Rudin Foundation, Inc.
St. Joe Minerals Corporation
Saks Fifth Avenue
Saks Fifth Avenue-Gimbel Brothers
Foundation, Inc.
The Scherman Foundation, Inc.
Schlumberger Horizons, Inc.
David Schwartz Foundation, Inc.
Servomation Corporation
Sperry Corporation Foundation
The Sperry and Hutchinson Company
The Starr Foundation
Sterling Drug, Inc.
Tetaco Philanthropic Foundation, Inc.
The Oakleigh L. Thorne Foundation
Time Inc.
Transway International Foundation
Tudor Foundation, Inc.
Unilever United States, Inc.
Union Carbide Corporation
Union Pacific Corporation
Union Pacific Foundation
United Brands Foundation
United Industrial Corporation
United Leaf Foundation
Wertheim & Co., Inc.
The Wheelabrator Foundation, Inc.
Laurence A. Wien Foundation, Inc.
John Wiley & Sons, Inc.
The H.W. Wilson Foundation, Inc.
Wysmont & Co., Inc.

Corporate Gifts-in-Kind

Citibank, N.A.
The City Investing Company
Coca-Cola Bottling Company of
New York, Inc.
D'Agostino Supermarkets
Hoffmann-La Roche Company
Philip Morris Incorporated

Animal Kingdom Campaign Contributors of \$1,000 and Over

Friends of ARC

Mr. and Mrs. Robert E. Blum
Helen F. Boehm
Mr. and Mrs. Edgar M. Cullman
C.B. Engelhard
Mr. and Mrs. James Evans
C. Sims Farr
Mr. and Mrs. William Ward Foshay
Dr. and Mrs. Henry Clay Frick II
Peter R. Gimbel
Mr. and Mrs. Robert G. Goelet
Nixon Griffin
Charles J. Harrington
Audrey P. Holden
Mr. and Mrs. Peter C.R. Huang
International Telephone and Telegraph Corporation
Mr. and Mrs. John N. Irwin II
Mr. and Mrs. Douglas Kreeger
Lars-Eric Lindblad
Sven-Olaf Lindblad
Royal Little
Mr. and Mrs. Hayward Manice
Otto Marx, Jr.
Charles W. Nichols, Jr.
Mr. and Mrs. Augustus G. Paine
The Sanky Perlowin Company
Mr. and Mrs. Milton Petrie
Mr. and Mrs. Howard Phipps, Jr.
Mr. and Mrs. John H. Phipps
Mr. and Mrs. Sumner Pingree III
Mr. and Mrs. Richard I. Purnell
Mr. and Mrs. David M. Schiff
Mr. and Mrs. Peter G. Schiff
Walter Schwab
H.C. Seherr-Thoss
Mr. and Mrs. James Stebbins
Chauncey D. Stillman
Dr. Margaret Olds Strahl
Mr. and Mrs. Walter C. Teagle III
Alice Tully
Elise S. Untermyer
Mr. and Mrs. Robert Vanderbilt
Frank Weeden
Mr. and Mrs. Robert Winthrop
Betty Wisdom
Rawson L. Wood
One anonymous donor

The Achelis Foundation
Cornelius R. Agnew, Jr.
The Annenberg Fund, Inc.
Arkville Erpi Fund, Inc.
The Vincent Astor Foundation
George F. Baker, Jr.
The George F. Baker Trust
The Frederick W. Beinecke Fund
Mrs. Harry Payne Bingham
Mr. and Mrs. Robert E. Blum
The Bodman Foundation
Georgiana E. Brooks
Helen W. Buckner
Hon. and Mrs. William A.M. Burden
The Louis Calder Foundation
The Carter Fund
Mr. and Mrs. James Walter Carter
Guy F. Cary
The Catto Foundation
Celanese Corporation
Chemical Bank
Citibank, N.A.
The Commonwealth Fund
Consolidated Edison Company of New York, Inc.
Constans Culver Foundation
Louise B. and Edgar M. Cullman Foundation
and the Samuel J. Bloomingdale Foundation
Geraldine R. Dodge Foundation, Inc.
The Dunlevy Milbank Foundation, Inc.
John Elliott
John Elliott, Jr.
The Lincoln Ellsworth Foundation
Mrs. Charles W. Engelhard, Jr.
John Clifford Folger
Foundation for the Needs of Others, Inc.
Dr. and Mrs. Henry Clay Frick II
General Foods Corporation
Mr. and Mrs. Peter R. Gimbel
Robert G. Goelet
Grace Foundation Inc.
The Griffin Foundation, Inc.
Peter Grimm
Raymond R. Guest
Gladys F. Harriman
Enid A. Haupt
Charles Hayden Foundation
William Randolph Hearst Foundation
H.J. Heinz II Charitable and Family Trust
High Winds Fund, Inc.
Patricia K. Hurd Trust
J.I. Foundation, Inc.
Mrs. L. Emery Katzenbach
The Kresge Foundation
L.A.W. Fund, Inc.
Frank Y. Larkin
Royal Little

John D. Macomber
The Mandeville Foundation, Inc.
Mr. and Mrs. Jan W. Mares
Anthony D. Marshall
Louise C.P. Marshall
William McChesney Martin, Jr.
The Louis Marx Foundation Inc.
Otto Marx, Jr.
Peter Matthiessen
Mayer Family Foundation
David Hunter McAlpin
The McGraw-Hill Foundation, Inc.
Mr. and Mrs. George W. Merck
The Charles E. Merrill Trust
Mobil Foundation, Inc.
Morgan Guaranty Trust Company of New York Charitable Trust
National Endowment for the Arts
New York Telephone Company
Nichols Foundation, Inc.
Mr. and Mrs. Augustus G. Paine
Richard T. Perkin
The Perkin Fund
Philip Morris Incorporated
Howard Phipps Foundation
Howard Phipps, Jr.
John H. Phipps
John Pierrepont
The Pleasant Street Foundation
Mrs. John L. Procope, Jr.
Eben W. Pyne
Rockefeller Brothers Fund
Mrs. John D. Rockefeller 3rd
Laurance S. Rockefeller
Arthur Ross Foundation, Inc.
The Kenneth Rush Foundation
John T. Sargent
The Schiff Foundation
The Society of the Four Arts
The Seth Sprague Educational and Charitable Foundation
The Starr Foundation
The Stebbins Fund, Inc.
Mrs. Roger W. Straus
Mrs. Arthur Hays Sulzberger
Surdna Foundation
Judith C. Symonds
Estate of Joseph A. Thomas
The Thorne Foundation
Michael Tuch Foundation, Inc.
Alice Tully
Union Pacific Foundation
Mr. and Mrs. Charles B. Webster
John Hay Whitney
Edward O. Wilson
Robert Winthrop
Women's Committee of N.Y.Z.S.
Three Anonymous Gifts

Parks Commissioner Gordon Davis, Mayor Edward Koch, and Manhattan Borough President Andrew Stein at the Central Park Zoo Press Conference.



Animal Kingdom Campaign Committee

John N. Irwin II, Chairman
Mrs. Vincent Astor, Vice-chairman
John Pierrepont, Vice-chairman
John T. Sargent, Vice-chairman
John H. Adams
Alexander Aldrich
Rand V. Araskog
John D. Backe
George F. Baker III
Edward Larabee Barnes
Leonard Bernstein
Robert E. Blum
John Cage
Guy F. Cary
John Chancellor
Craig Claiborne
Ramsey Clark
Judy Collins
William Conway
Edward N. Costikyan
George Crumb
Mrs. Edgar M. Cullman
Joseph F. Cullman 3rd
Stephen I. D'Agostino
Mrs. Charles A. Dana, Jr.
Philippe de Montebello
Barbaralee Diamonstein
Rene Dubos
John Elliott, Jr.
Osborn Elliott
Ralph Ellison
Mrs. Charles W. Engelhard
Amitai Etzioni
Mrs. James H. Evans
C. Sims Farr
Mrs. William Ward Foshay
Henry Clay Frick II
Brendan Gill
Peter R. Gimbel
Robert G. Goelet
Harmon H. Goldstone
Edward Gorey
Nixon Griffiths
Tammy Grimes
Gilbert M. Grosvenor
Bernhard Grzimek
Thomas H. Guinzburg
Arthur Hauspurg
August Heckscher
Andrew Heiskell
Lillian Hellman
Mrs. Ernest Hemingway
Nat Hentoff
Katharine Hepburn
Peter C.R. Huang
Jacob Javits
Arnold P. Johnson
Henry A. Kissingner
Edward E. Klein
Hilary Knight
Frank Y. Larkin
Joshua Lederberg
Samuel I. Lefrak
John E. Leslie
Roy Lichtenstein
John V. Lindsay
Royal Little
John D. Macomber
Peter Marler
Alton G. Marshall
Anthony D. Marshall
William McClesney Martin, Jr.
Otto Marx, Jr.
Peter Matthiessen
David Hunter McAlpin
William J. McGill
Harold W. McGraw
William Barnabas McHenry
Frederick A. Melhado

G.W. Merck
Daniel P. Moynihan
Rupert Murdoch
Louise Nevelson
Charles W. Nichols, Jr.
Augustus G. Paine
William S. Paley
Joseph Papp
Mrs. Gordon B. Pattee
Roger S. Payne
Richard T. Perkin
Howard Phipps, Jr.
John H. Phipps
Summer Pingree III
Harold Prince
Mr. and Mrs. John L. Procope, Jr.
Richard I. Purnell
Eben W. Pyne
Robert Rauschenberg
Henry Hope Reed
William K. Reilly
Mrs. Harmon L. Remmel
Laurance S. Rockefeller
Julius Rudel
Thomas R. Rudel
George D. Ruggieri, S.J.
Guy G. Rutherford
George B. Schaller
Arlie Schardt
David T. Schiff
John M. Schiff
Arthur Schlesinger, Jr.
Richard J. Schwartz
Irene Selznick
Paul Simon
Stephen Sondheim
Elvis J. Stahr
Mrs. A.H. Stevenson
Chauncey D. Stillman
Gardner D. Stout
Judith C. Symonds
Walter C. Teagle III
Mrs. Joseph A. Thomas
Russell E. Train
Alice Tully
Mrs. George L. Unis
Mrs. Gerrit P. Van de Bovenkamp
William vanden Heuvel
William Wachenfeld
Lila Acheson Wallace
Mr. and Mrs. William H. Whyte
Edward O. Wilson
Robert Winthrop
Mrs. Whitney Young, Jr.

Aquarium and Osborn Laboratories

Planning Committee

Henry Clay Frick II, Chairman
George F. Baker III
William Conway
Peter R. Gimbel
Nixon Griffiths
John R. Hearst, Jr.
Michael T. Martin
Edith McBean
Richard T. Perkin
Howard Phipps, Jr.
John Pierrepont
George D. Ruggieri, S.J.
Peter G. Schiff
Walter C. Teagle III

Business Committee

Edgar M. Cullman, Co-chairman
John Elliott, Jr., Co-chairman
Rand V. Araskog
Henry A. Correa
Joseph F. Cullman 3rd
Mrs. Charles A. Dana, Jr.
Paul W. Douglas



"Annie" cast at the Children's Zoo.

Mrs. James H. Evans
A. Edwin Fein
André Galarne
Thomas H. Guinzburg
Arthur Hauspurg
Edwin A. Heard
John Hennessy, Jr.
Jack R. Howard
Peter C.R. Huang
John E. Leslie
John D. Macomber
Alton G. Marshall
Otto Marx, Jr.
David B. McCall
Donald F. McCullough
William J. McNamara
Frederick A. Melhado
John Pierrepont
Mary Jane Pool
Mrs. John L. Procope, Jr.
Richard I. Purnell
Eben W. Pyne
John T. Sargent
Richard J. Schwartz
Oakleigh B. Thorne

Conservation Committee

Frank Y. Larkin, Chairman
John L. Behler
Donald F. Bruning
Archie Carr, III
William Conway
Mrs. Edgar M. Cullman
James G. Doherty
Emil Dolensek
C. Sims Farr
Mrs. William Ward Foshay
Henry Clay Frick II
Robert G. Goelet
Nixon Griffiths
Mrs. Philip D. Holden
Mark C. MacNamara
Anthony D. Marshall
John Mayer
Charles W. Nichols, Jr.
Roger S. Payne
Howard Phipps, Jr.
Harmon L. Remmel
George D. Ruggieri, S.J.
George B. Schaller
Christine Sheppard
Thomas T. Struhsaker
David Western

Development Committee

John Pierrepont, Chairman
Mrs. Vincent Astor, Vice-chairman
Guy F. Cary
John Chancellor
Edgar M. Cullman
John Elliott, Jr.
Mrs. William Ward Foshay
Nixon Griffiths
John N. Irwin II
Frank Y. Larkin
Frederick A. Melhado
Howard Phipps, Jr.
Summer Pingree III
Mrs. John L. Procope, Jr.
Laurance S. Rockefeller
Judith C. Symonds

Editorial Committee

John T. Sargent, Chairman
William Conway
John Elliott, Jr.
Gilbert M. Grosvenor
Peter Matthiessen
Howard Phipps, Jr.
George D. Ruggieri, S.J.
George B. Schaller
Eugene J. Walter, Jr.

Exploration and Scientific

Collection Committee

Nixon Griffiths, Chairman
George F. Baker III
John L. Behler
Ralph W. Brauer
Donald F. Bruning
William Conway
James G. Doherty
Edwin J. Gould
Frank Y. Larkin
Anthony D. Marshall
Peter Matthiessen
G.W. Merck
Richard T. Perkin
Howard Phipps, Jr.
George D. Ruggieri, S.J.

Women's Committee

Officers and Board of Directors

Mrs. Joseph R. Siphon, President
Julie Kammerer, Vice-president
Sheila Pulling, Vice-president
Mrs. Alexander B. Slater, Secretary
Mrs. George Moss, Treasurer
Mrs. Benjamin A. Groves, Assistant Treasurer
Mrs. Alfred Lee Loomis, III, Assistant Secretary
Mrs. George F. Baker III
Lynn Chase
Mrs. Charles A. Dana, Jr.
Mrs. R. Leigh Duemler
Mrs. Ridgely W. Harrison
Mrs. Amory Houghton, Jr.
Mrs. Jack R. Howard
Mrs. Hoyle C. Jones
Mrs. Gordon B. Pattee
Mrs. Richard T. Perkin
Mrs. Eben W. Pyne
Mrs. Tucker Ridder
Mrs. James F. Stebbins
Mrs. Joseph A. Thomas
Mrs. Robert W. Young, Jr.

Advisory Board

Mrs. Vincent Astor
Mrs. Driggs Hultkrans
Mrs. Charles W. Nichols, Jr.
Mrs. Harmon L. Remmel
Mrs. Anne H. Stevenson
Mrs. Landon K. Thorne, Jr.

General Society Staff

William Conway, *General Director*
John G. Hoare, *Comptroller*
John McKew, *Director of Administrative Services*
Timothy O'Sullivan, *Deputy Director of Administration*
Gregory Long, *Director of Public Affairs*
Richard Lattis, *Director of the City Zoos Project*
Marie Sexton, *Membership Chairman*
Arnold Harlem, *Business Manager*
John Albers, *Assistant Comptroller*
Ronald Ventarola, *Chief Accountant*
Dolores Hoglund, *Accounting Manager*
Francis Kohlasch, *Purchasing Manager*
Angelo Monaco, *Personnel Manager*
Walter Deichmann, *Acting Chairman, Exhibition and Graphic Arts*
Kathleen Wilson, *Government Affairs Officer*
Judith Van Pelt, *Manager of Development*
David Mleczko, *Public Relations and Advertising Manager*
Eugene J. Walter, Jr., *Editor and Curator, Publications*
William Meng, *Assistant Curator, Photographic Services*
Penelope J. O'Prey, *Assistant Curator, Publications*
William Bridges, *Curator of Publications Emeritus*

New York Zoological Park

William Conway, *Director*
David Cole, *Deputy Director of Operations*
James G. Doherty, *General Curator and Curator, Mammalogy*
Mark C. MacNamara, *Associate Curator, Mammalogy*
Donald F. Bruning, *Curator, Ornithology*
Christine Sheppard, *Assistant Curator, Ornithology*
John L. Behler, *Curator, Herpetology*
Danny C. Wharton, *Registrar*
Richard Lattis, *Curator, Education*
Annette Berkovits, *Associate Curator, Education*
Michael Gallo, *Manager, Security*
Richard Gagliano, *Assistant Manager, Security*
Charles B. Driscoll, *Director of Operations Emeritus*
Grace Davall, *Curator Emeritus*
Roland Lindemann, *Mammal Management Consultant*
John Lukas, *Associate in Mammalogy*
Jean Delacour, *Giuseppe de Campoli, Ostrom Enders, Winston Cuest, Jr., Frank Y. Larkin, William K. Macy, Jr., S. Dillon Ripley, Charles Sivelle, Charles D. Webster, Field Associates in Ornithology*
William H. Zovickian, *Field Associate in Herpetology*

New York Aquarium

George D. Ruggieri, S.J., *Director*
Robert Hayden, *Assistant Director of Operations*
Karen Hensel, *Curator, Education*
Paul J. Cheung, *Pathologist*
Klaus D. Kallman, *Fish Geneticist*

Osborn Laboratories of Marine Sciences

George D. Ruggieri, S.J., *Director and Experimental Embryologist*
Ross F. Nigrelli, *Senior Scientist*
Paul J. Cheung, *Pathologist*
Klaus D. Kallman, *Fish Geneticist*
Dov Kanner, *Microbial Ecologist*
Eli D. Goldsmith, *Scientific Consultant*
C.M. Breder, Jr., *Research Associate, Ichthyology*
Erwin J. Ernst, *Research Associate, Estuarine and Coastal Ecology*
Myron Jacobs, *Research Associate, Cerebral Neuroanatomy*
Martin P. Schreibman, *Research Associate, Fish Endocrinology*

Animal Research and Conservation Center

George B. Schaller, *Director and Research Zoologist*
Archie Carr, III, *Assistant Director*
Roger Payne, Thomas Struhsaker, David Western, *Research Zoologists*
William Conway, *Senior Conservationist*
Lynn Holstein, *Development Officer*
Walter Auffenberg, Lysa Leland, Shirley Strum, Arturo Tarak, Stanley Temple, *Conservation Fellows*
Thomas Butynski, Eleanor Dorsey, John Fryxell, Jesse C. Hillman, Dale M. Lewis, Cynthia Moss, Katharine Payne, Joyce Poole, Howard Quigley, Clifford Rice, A.R.E. Sinclair, Keith Williams, *Research Fellows*

Wildlife Survival Center

Jim Murtaugh, *Associate Curator of Mammalogy*
Alfred J. Valenzuela, *Assistant Curator of Ornithology*
J.T. Woods, *Island Supervisor*
Royce Hayes, *Assistant Supervisor*
Morton Silberman, *Clinical Consultant*

Animal Health

Emil P. Dolensek, *Veterinarian*
Janet Stover, *Medicine Resident*
Jay Tappe, *Pathology Resident*
Nancy Schaffer, *Reproductive Physiologist*
Lyndall Erb Meuli, *Endocrinologist*
Consultants
Raymond Napolitano, *Microbiology*
Lucy Clausen, *Parasitology*
Roy Bellhorn and Paul Henkind, *Ophthalmology*
Henry Clay Frick II, *Obstetrics and Gynecology*
Stephen A. Schwartz, *Pediatrics*
Richard Lee, *Internal Medicine*
Harold S. Goldman, *Radiology*
John Budinger, *Pathology*
Robert Byck, *Pharmacology*
Jacques Wallach, *Clinical Pathology*
James F. Grillo, *Surgery*
Animal Medical Center, *Pathology*
Julie Kazimiroff, *Dentistry*

Credits

Design: Incentra International, Inc., New York
Editor: Don Goddard
Photography: Cathy Blaivas, pp. 32, 49, 63, 64; Donald Bruning, cover, title page; Archie Carr, III, p. 41; William Conway, p. 24; courtesy John Inanga, p. 26; Nancy Kaye, p. 34; Bill Meng and Dennis DeMello, pp. 4, 6, 7, 8, 10, 11, 13, 16, 18, 19, 20, 21, 22, 24, 29, 31, 35, 36, 46, 48, 51, 55, 60, 61, renderings by Mark de Nalovy-Rozvadovska, pp. 14 (below), 15; New York Department of Parks and Recreation, pp. 12, 14 (above), 62; NYZS, 40; George B. Schaller, p. 25; Amy Vedder and William Weber, p. 38.

Typographer: Susan Maher

Printer: Kashan/Weber



As a growing youngster, Astor has become a mischievous but willing pupil and the star of Wild Asia.

Recommended Form of Bequest

The Trustees of the Society recommend that for estate planning purposes, members and friends consider the following language for use in their wills:

"To the New York Zoological Society, a not-for-profit, tax-exempt membership organization incorporated by the laws of the State of New York in 1895, having as its principal address the New York Zoological Park, Bronx, New York 10460, I hereby give and bequeath _____ for the Society's general purposes."

In order to prevent the Society from incurring future administrative cost, it would be helpful if you would consider adding the following language to any restrictions you may wish to impose on your bequest:

"If at some future time, in the judgment of the Trustees of the New York Zoological Society, it is no longer practicable to use the income or principal of this bequest for the purposes intended, the Trustees have the right to use the income or principal for whatever purpose they deem necessary and most closely in accord with the intent described herein."

If you wish to discuss the language of your bequest with a member of the Society's staff, please be in touch with the President's office, (212) 220-5155.

Howard Phipps, Jr.
President

Cover:

After two years of planning, birds of paradise will once again be exhibited at the Bronx Zoo, re-establishing the Zoo's historic connection with this magnificent avian family. In 1929, Curator of Birds Lee Crandall concluded a seven-month expedition to Papua New Guinea that resulted in one of the finest collections of these birds ever assembled. In late June 1982, Curator of Ornithology Donald Bruning revisited the site and captured several birds of paradise, including the Raggiana shown here in full courtship display, along with other exotic specimens.

The acquisition of these rarely exhibited birds, which are found only in New Guinea and nearby islands, is part of a larger program that involves captive breeding at the Zoo and in cooperation with other zoos, and an effort to preserve many of the approximately forty species in their native habitat. Preserves have already been planned in New Guinea, with counsel from Dr. Bruning, and the New York Zoological Society will play an important role in the conservation effort through the sponsorship of its Animal Research and Conservation Center.

New York Zoological Society
Bronx Zoo
Bronx, New York 10460



